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ORIGINAL COMMUNICATIONS.

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DEFORMITIES OF THE BONES OF THE FACE AND NOSE.

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Much has been written upon the etiology of deformities of the nasal bones, especially deflection of the septum.

Numerous theories have been advanced to account for these deformities. Quelmalz and Schultz believed them due to the action of astringents drying up the membrane, causing it to contract and thus drawing the bone and cartilage down upon itself. In Morgagni's opinion they were due to excessive development of the vomer. Trendelenburg held that they were due to a crowding up of a high-arched palate since he found the two conditions frequently associated. Jarvis, after citing four cases in the same family, suggested the deformities were due to direct heredity. While the neurotic or degenerate states that underlie building up of the system may produce deflection, direct heredity here as elsewhere is rare. Schaus' and Welcker's investigations show that there is a faulty development of the facial skeleton. Bosworth[1] and others have charged septal deformities to traumatism. The clinical history of many cases affords, according to Bosworth, direct evidence of this and even in those cases in which the direct injury is not testified to, he thinks it is safe to say that an injury has occurred though this may have been so slight as not to have excited especial attention at the time of the occurrence. "Injury to the nose need not necessarily give rise to the immediate development of a notable deformity, as in fractures, but it may set up a low

1 Diseases of the Nose and Throat.

grade of morbid action, which, going on through a number of years, will finally develop a condition by which the normal function of the nose is seriously hampered." The point on which he lays especial emphasis is that deformity is primarily the result of traumatism and secondarily of a slow inflammatory process which results therefrom.

The theories most deserving attention are those of Bosworth and Trendelenburg. In an examination of 11,000 skulls, I found that owing to the fragility of the septum, the whole or anterior part of it was lost in many. But 7,600, therefore, had sufficient remaining to give an idea of its shape; 5,762 of this number showed marked deformities. Deflection of the septum did not extend uniformly throughout. On careful examination of these deformities, it was found that the septum could be divided into three parts, anterior, middle and posterior deflection. While traumatism occasionally may produce deflection in the anterior third of the nose, how it could produce deflection merely in the middle or posterior third of the septum is not very demonstrable.

That deformity and fracture of the septum may, however, be traced to traumatism, I am personally aware. In one case, when a boy of sixteen, I asserted my rights and received a blow upon the nose from my opponent which fractured the cartilage and made a lasting impression upon me. The theory that from 50 to 80 per cent or even 5 per cent of deformities of the septum are due to such injuries is demonstrably illogical. In the large number I examined, 2,684 possessed what appeared to be fracture. The vomer in many of these specimens commenced to deflect at its outer surface and gradually deepened until at about its middle or posterior two-thirds, it reached its deepest part and then gradually decreased in depth until the posterior attachment was reached. Its appearance was not unlike the sail of a ship. On the convex surface, in many cases, nature had thrown out provisional bone to support this curvature, which might be considered a break, but in most cases simply a bend. That a blow, whether slight or as powerful, could produce a fracture of the vomer, the greatest deformity of which is located from .75 to 2 inches inside the nose from the point of the nasal spine seems hardly probable. Anterior and posterior to this deflection, the vomer appeared in most cases to be nearly or quite normal. In nearly every case of fracture would involve only one-half of the vomer, the other simply bending; that

such a condition could be brought about by a blow is absurd. It seemed the greatest deformity was the thinnest part of the bone.

It would appear to be a very easy matter in the skull to decide whether a fracture had taken place before or after complete ossification by the character of the wound, thus approximating the date of the injury. That it was caused by a low form of inflammation set up as a result of a slight injury in utero or after birth does not seem rational since the inflammatory condition must necessarily extend upon both sides of and through the septum extending its entire length. If due to an inflammatory condition the bend or break would be found at any part of the septum and the position and shape would be different in every case. As the location upon the septum from above downward is nearly always the same and as the shape is always from before backward, inflammation could not produce it. In order to produce a fracture, there must be excess of septum. Therefore, unless the fracture is the result of a direct blow it would require years for sufficient growth and curvature to produce a condition in which fractures or even an abrupt bending could take place.

The theory that deformity is "primarily" the result of traumatism due to injury in utero or at the time of delivery or even subsequently, except by direct force and secondarily to a slow inflammatory process, will, therefore, not account for these deformities.

A theory much in favor is that of Trendelenburg. That these deformities are "due to a crowding up of a high-arched palate.

A hypothesis to be accepted must not only explain all the facts, but must exclude all other explanations. A high contracted vault or "arched palate" is never seen with the first set of teeth. Deformed palates never begin development until the sixth year and development is always completed by the twelfth. Deflected septa are often observed before the sixth year. It is necessary to settle what constitutes a high, contracted arched palate. The height of the vault must be measured to find out wherein they differ. This measurement is taken at the gum margin with instruments (Fig. 1) between the second biscuspid and first permanent molar to a point at the median line of the vault. In measurements of 4,614[1] normal jaws, it was found that lowest was .21 of an inch, the highest .84 of an inch, with an average of .58 of an inch. In brachycephalic

1 Mouth-breathing not the cause of contracted jaws and high vaults. Dental Cosmos, November, 1891.

white heads with large jaws and normal dental arches, the vault varies in height from .37 inches lowest, to .68 inches highest. The

Fig. 1.

colored varies between lowest .50 inches and highest .75 inches. The mesocephalic white varies between .31 lowest and .68 inches highest; the colored between .50 lowest and .62 highest. The

dolichocephalic white varied between lowest .62 and highest .81; the colored between lowest .56 and highest .68.

The average height of brachycephalic vaults white is..... .54
The average height of brachycephalic vaults colored is..... .61
The average height of mesocephalic vaults white is..... .52
The average height of mesocephalic vaults colored is..... .60
The average height of dolichocephalic vaults white is..... .74
The average height of dolichocephalic vaults colored is.... .62

The height of vaults in V-shaped arches varies between lowest .71 and highest .84. The average is .55. The height of vault in saddle arches varies between lowest .71 and highest .84. The average is .60. The height of vault in semi-V and semi-saddle arches varies between lowest .75 and highest .84; average .56.

Fifty-eight one-hundredths of an inch being the average, it is evident that in the deformed vaults, there is a difference of .02 of an inch only in either direction. In the extreme brachycephalic and dolichocephalic there is but .06 of an inch. In twenty-four

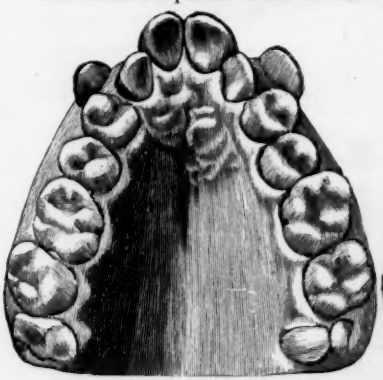


Fig. 2.

Fig. 3.

mouth-breathers, the lowest measurement was .42; highest .75, with an average of .61. While the average is .03 of an inch higher than the average normal vault, the highest vault of mouth-breathing is .10 inches lower than the highest normal vaults. The deception as to height is due to contraction of the dental arch.

In order to classify the various forms of deformed jaws, 3,000 plaster casts were used. A palate may be high and broad, high and narrow, high and deformed. The palate could be low and broad, low and narrow and low and deformed.

Two forms of deformed dental arches and vaults were specially noticeable. The V, (Fig. 2), and the saddle (Fig. 3). All other forms were modifications of these two. There is also hypertrophy of the alveolar process partial or complete. The vault, however, is never involved. (Fig. 4). It is claimed that in mouth-breathing

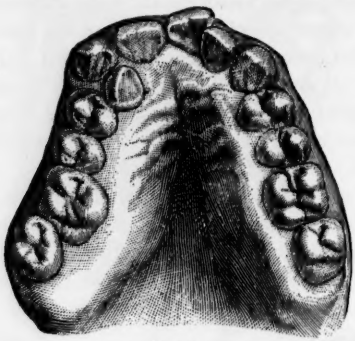


Fig. 4

the muscles of the cheeks press against the sides of the jaws, carrying the jaws and teeth inwards (producing these deformities) and

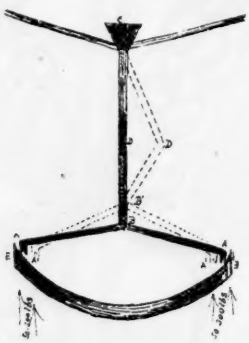


Fig. 5. After Wright.

vault upwards (Fig. 5) in this manner crowding the septum to the right or left.

In the V-shaped arch, commencing at the first permanent molar, there is gradual narrowing of the dental arch and alveolar process toward the median line, where the incisors approximate a V-point, or may stand in normal position to each other. Invariably

there is protrusion of the teeth and alveolar process, not of the jaw. In the saddle-shaped arch the biscuspids are carried inward and the deformity is invariably situated between the first permanent molar and the cuspid. Unlike the V-shaped variety, the anterior teeth and alveolar process never protrude in this class of deformities. The contracted hard palate is always associated with the V-shaped variety, in most cases extends backward to the second bicuspid, and is never seen with the saddle-shaped variety.

The vault commences to slope slightly from the neck of the incisor until it reaches an imaginary line drawn across the roof of the mouth from the right first biscuspid to the left first biscuspid, here it slopes gradually or abruptly upward until a point is reached central and vertical to a line drawn across the jaw from crest to crest, between the second biscuspids and first molars. From this point posteriorly to the soft palate, the dame is usually nearly level and parallel with the plane of the alveolar crests of the biscuspids and molars when it gradually slopes and unites with the soft palate. Occasionally there is slight depression and sometimes corresponding slight elevation. There are so inconsiderable as to escape notice unless careful examination be made.

In mouth-breathing, the lower jaw usually drops just sufficiently for the passage of the same volume of air which would pass through the nasal cavities when in normal condition. (Fig. 6.) Each open-

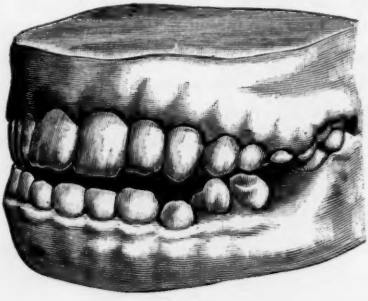


Fig. 6.

ing is equal to about one-half an inch in transverse area. Old people often sleep with the mouth open and to the fullest extent. These deformities of the jaws and teeth never occur after eruption of the teeth about the twelfth year.

On opening the mouth there is sense of tension of the orbicularis oris, but not of a pressure of the buccinator, no matter how

widely the mouth may open. This muscle is always passive, except in the act of blowing or eating. Contraction during sleep is out of the question. As the buccinator muscle extends anteriorly to the first biscuspid only, it cannot be productive of the V-shaped variety of deformity in which is also found the contracted vault. Therefore, the only deformity that can be so produced is the saddle-shaped variety. The orbicularis oris muscle cannot produce the contraction, since when the mouth is open the pressure, if any, on the six anterior teeth, is backward. The teeth would thus be carried in the opposite direction from that which must be taken to produce this deformity. The pressure is just as great upon the incisors as upon the cuspids, thereby holding them in place. More force is exerted by the orbicularis oris upon the six anterior teeth when the mouth is open than could be exerted by the buccinator muscle, which would tend to hold the anterior teeth in place. Apices of teeth rarely move when pressure is brought to bear upon their crowns for the purpose of regulating them. Teeth, like the cuspids, having long roots, are hence liable to move than teeth like the lateral incisors or bicuspids, with short roots. Since on moving a tooth the greatest change takes place at the neck, the greatest absorption and deposition of bone must occur at that point. The roots of the cuspids are larger and longer than those of any other teeth. Unlike other teeth, the tooth germs are situated considerably higher and farther toward the outside of the alveolar process, hence when they come closely into position they diverge from the apices to the crowns. All other teeth stand nearly or quite perpendicular, hence the roots of these do not influence the hard palate. The first permanent molar and the teeth posterior to it are never involved, except from local causes. The center of the buccinator muscle in both directions is located at this tooth. How, then, since all the teeth are covered by the muscle upon one side, could half be carried inward and the other half remain normal?

Were mouth-breathing the cause of the contraction, both sides should contract alike and the deformity be uniform upon both sides. This is never the case. Then the first permanent molars would be carried inward, which rarely ever occurs. The want of uniformity of the two sides is easily recognized. Muscles cannot contract to a degree sufficient to induce the pressure necessary to produce a deformity. Pressure of the contractile tissue upon the crowns of teeth is not sufficient to affect the alveolar process through the roots of the teeth. Even could it modify that spongy structure, its

force must stop there and not extend to the osseous vault, and result in bending it out of shape. In most cases the diameter of the superior maxilla, its alveolar process and teeth is less than that of the inferior maxilla, alveolar process and teeth. This is always the case in the worst forms of dental irregularities. In such cases, the muscles and cheek could not press upon the teeth and alveolar process of the upper jaw.

The changes which take place in the bone are not a bending in at one place and a forcing out at a weaker point to compensate for the space lost, but an absorption and deposition of bone at the point of pressure. Even if these last conditions were the case, the strong pillar of bone (the anterior alveolar process), situated at the very point of contraction of the alveolar process, would constitute a strong bulwark for resistance to the pressure, which is suppositiously acting at a distance from the center of the vault. It would be equally impossible to produce sufficient pressure from without out to break the dental arch as to break by the weight of a building the arch of a door or window. The tongue exerting much greater force in the act of swallowing, would prevent inward movement of the teeth, were the slight pressure from the cheek muscles the cause of the deformity.

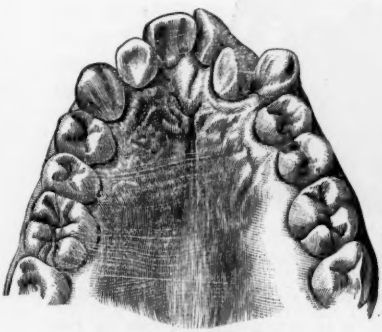


Fig. 7.

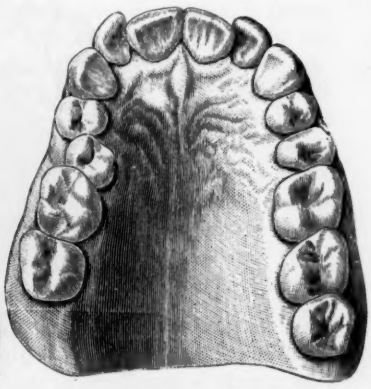


Fig. 8.

Were it possible for the buccinator to produce this contraction, modification of the osseous structures must be uniform. This would shut out the semi-V-shaped (Fig. 7) and semi-saddle-shaped arches entirely (Fig. 8) and a majority of other irregularities of

the teeth in which there is bi-lateral asymmetry. The bi-lateral muscle cannot act on one side while that on the opposite side remains passive. Partial V-shaped (Fig. 9) and partial saddle-shaped

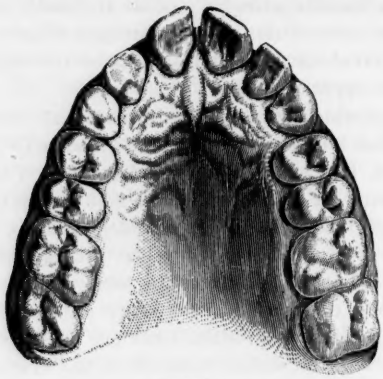


Fig. 9.

(Fig. 10) arches render the theory still more untenable. In these varieties sudden bends inward occur where but one or two teeth

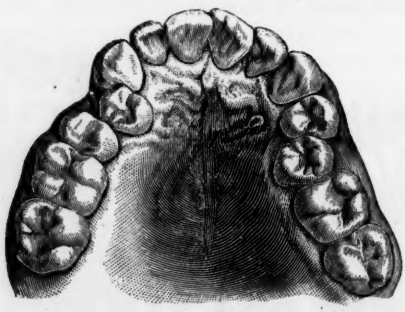


Fig. 10.

may be involved. These abberations could b eproduced only by centralization of force on one given point or fiber of muscle. Since the muscle is penniform in shape, it is impossible for one or two fibers of the muscle to exert their influence upon a biscuspid. (Fig. 11.) It would naturally lap two or more teeth. Lastly, the buccinator acting as all voluntary muscles do, uniformly throughout its extent of contraction, must be just as efficient below a median bisecting line in producing a narrow contracted arch as in its up-

per portion. Therefore, the lower maxilla should be contracted whenever the upper one is. This is a decided imposibility. A V-shaped arch can never occur upon the lower jaw were the teeth to articulate normally since these teeth strike inside of the upper and are thus prevented from moving forward. A saddle, partial saddle or semi-saddle arch may occur on the lower jaw, but these deformities are not often seen. When they do occur, they are the result of improper occlusion with the teeth of the upper jaw. In

Fig. 11.

semi-V and partial V-shaped arches, the alveolar process is always contracted upon the side of the deformity. If one side of the arch be contracted more than the other, the alveolar process contracts in proportion to the amount of deformity; the vault on that side is not carried up beyond the other side, which is normal. In the saddle, semi-saddle and partial saddle-shaped arches, the alveolar process is built up about the teeth in precise conformity to the nature of the shape of the arch. If three thouand models of the upper jaw be arranged in groups according to the forms here represented and the arrangement of the teeth in each group examined very closely, no two will be alike in either group. An external force acting upon the jaws from the outside could hence not possibly be a cause. Were that possible, all models of one variety would have a definite type.

On examination of twenty-four mouth-breathers, ten were found to have normal dental arches, one V, eight partial V, and three semi-V, and two semi-saddle, one of which was the result of hypertrophy of the alveolar process: The relations of the teeth to each other in deformed dental arches, therefore, are such that no one familiar with mechanical laws can accept such a theory. Pres-

sure as applied by the cheeks and lips could no more break a dental arch than a given amount of pressure break an arch of brick or stone. Those who advocate the theory of the vault being carried upward and causing deflection of the septum are certainly not familiar with the laws of mechanics nor with the anatomy of the structure under discussion.

Were it possible for the muscles of the cheeks to carry the dental arch inward, how could it affect the vault? In the first place, the movement of the teeth in the alveolar process is due to an inflammatory action producing halisteresis, Volkman's perforating canal absorption, and osteoclast absorption. There is no bending of bone in any direction in these cases. Again were it possible for the muscles of the cheeks to bend the teeth and alveolar process inwards, what effect would it have upon the vault? The thick anterior alveolar process together with the dense smooth bone in the anterior floor of the nares built like an inverted double arch with the superior maxillary bones, which form the outer walls of the nose, (Fig. 12) must convince the most skeptical that it is never

Fig. 12

pushed upward from any cause, since a larger arch is pushing against two smaller heavier arches, the two halves of the maxillary bones. To an engineer mechanic force exerted in either direction would produce no effect. There must be another cause for the deflected anterior third of the nasal septum. The greatest contraction of the dental arch is in the biscuspid region, which would naturally influence the middle third of the septum. Since the facial surfaces of the right and left superior maxillary bones form the anterior surfaces of the nose reinforce d by the lower borders of the

orbit, and the malar processes, any amount of force exerted on the alveolar process and teeth could not be exerted through these walls to influence the middle third of the septum. There being no contraction of the alveolar process at the second and third molars and very little if any at the first molar, relationship with the posterior third of the septum is out of the question.

The development of the vault can be studied from an examination of the thirty-six model drawings, given elsewhere.[1]

A ridge is sometimes observed extending from the anterior alveolar process along the entire length of the suture. This may be located entirely at the middle third. This ridge takes different shapes. (Fig. 13.) Sometimes grooves (Nos. 2 and 3) are observed upon either side of the depression. These grooves have been charged to ossification of the vomer, producing rigidity of the suture and the bone upon either side is afterward carried up.

According to Clouston, "Those palates where the deformity consisted in a ridge down the center antero-posteriorly, seemed to show that in them the deformity took place at a later period than in the other deformed palates. When the nasal septum was getting stronger and kept the center of the palate down, while on each side of it the palate was drawn up, making two vaults side by side, instead of one."

The amount of resistance in a triple arch, each fortified by the other, (Fig. 12) to say nothing of the heavy suture and thick, hard palate bracing it, would certainly suggest to any analytic mind the impossibility of such a theory. The vomer ossifies about puberty, the maxillary bones usually early in life. It seems strange that a thin, cartilaginous structure can be considered in connection with either pulling or pushing since the least deviation from a straight line would preclude such a power. These depressions are observed in vaults where the vomer is straight. They are found in lengths of from one-half to one inch in modern skulls and individuals as well as in ancient. Did the septum carry the vault down as suggested by Clouston, a like depression would be observed in the floor of the nose. In 1,367 skulls with this deformity, the floor of the nose and the connection of the septum were always smooth and evenly developed throughout its entire length. These projections are developed as early as the second year, while the vomer frequently remains unossified until eight or ten years of age, and in some cases much longer.

[1]Talbot, Osseous Deformities of the Head, Face, Jaws and Teeth.

Deformed septa are found in the early races who never have contracted high vaults. Theile, in 117 skulls, found the septum normally placed in twenty-nine. Semeleder in 49 found 35 deflected. Harrison Allen in 58 found 40 deflected. Mackenzie in

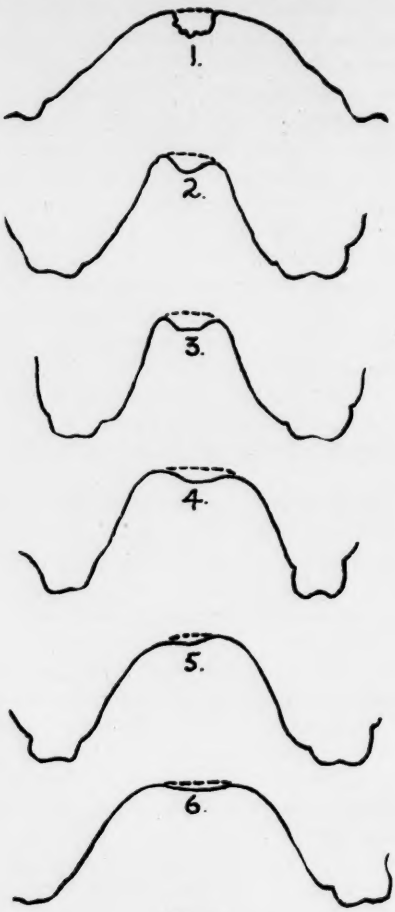


Fig. 13.

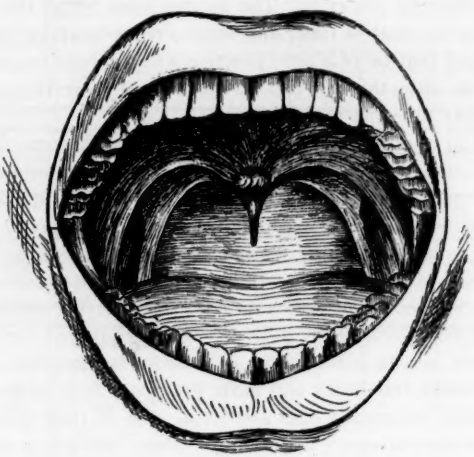
2,152 found 1,657 septa deflected. Zuckerkandl in 103 found 24 deformed. Harrison Allen found 21.5 per cent of 93 negro skulls deformed. Of 687 ancient Peruvian skulls, 147 possessed deflection.

In 67 stone-grave Indians, 34 were deformed. In 18 moundbuilders 10 were deflected. Of 6 California Indians 2 were deformed. Of 28 skulls of ancient Hawaiians, deflection of the septum was noticed in 23. Some in the anterior third, some in the middle third and others in the posterior third. This array of evidence in normal vaults and jaws conclusively destroys the theory that high vaults and contracted arches is a cause.

SUPERNUMERARY UVULA.

BY JOSEPH MULLEN, M. D., HOUSTON, TEX.

The patient in whom the above condition of supernumerary uvula was present, was a male negro, 25 years of age, well developed, and in apparently good health.



A small fish bone was removed from a follicle in the left tonsil; otherwise the parts were devoid of inflammation.

A NEW FIELD OF HEARING CHART.

BY DERRICK T. VAIL, M.D., CINCINNATI, O.

The functional hearing tests now in vogue are woefully deficient in enabling us to quickly estimate the exact status of audition.

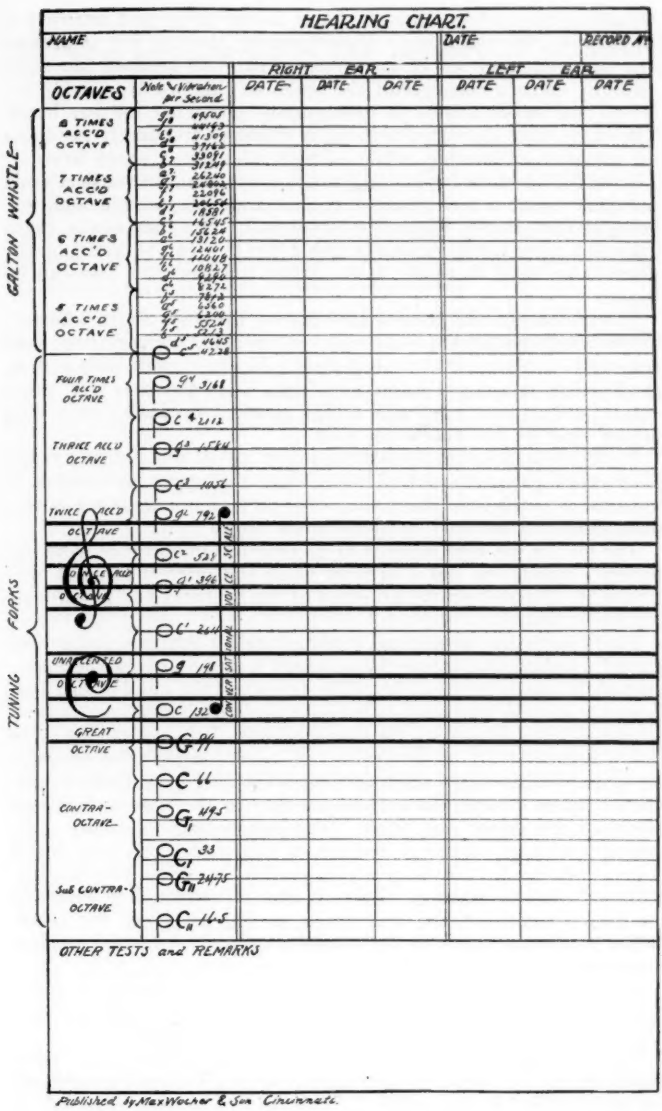
It is next to impossible with the means now at hand for many of us to know in a quick or even in a pains-taking way just what the hearing power of a case is. We use the watch, the low audible voice, the forced whisper, the acoumeter, the tuning fork, the Galton whistle, bone conduction, air conduction, Rinne, Weber, Bing, Schwabach, Gelle, etc., etc., and after spending a progidious deal of time, energy, thought and care, we are quite at sea as to just what the hearing power is. The various tests entail the expenditure of a great deal of time, and much record keeping and during the rush and tension of a busy practice we are prone to go through the motions after the first test and promise a more thorough testing the next time the patient calls.

I found in my own practice that it was a burdensome task to sit down and unravel the repeated records of a given case and felt the need of a graphic method of recording the tone limits so that all that would be necessary would be to glance at the record and at once have good conception of what my previous tests revealed.

This new and entirely original chart has been in active operation in my office during the past year and has been of service in the rapid comprehension of my patients' hearing power.

The chart, as you will observe, is fashioned somewhat after Bezold's, although less bulky and more graphic. It is built upon the musical scale, having the bass and treble clefs in their proper position in the normal range of hearing. There are about eleven octaves, beginning with the lowest possible note perceptible to the human ear, viz: C_2 in the sub-contra octave (Helmholtz of 16.5 vibrations, and ending at g^8, the highest perceptible tone, having about 50,000 vibrations.

From the lowest tone to C^5 the notes are elicited by the tuning forks and from C^5 to g^8 inclusive, the notes are from the New Galton whistle. These instruments are in the Bezold's set made by Edelman of Munich, but any set of whistles, rods or tuning forks, which will accurately deliver the desired tones, will answer in de-



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termining the auditory limits. Tone is one thing and intensity is an entirely different thing. Unfortunately, there is not at present any instrument or set of instruments that will produce the same intensity of tone throughout the scale, so that we are readily deceived and easily misled in determining just what the ear hears. The same note delivered with light intensity frequently produces no sensation of hearing, while of high intensity is easily heard.

It will be noticed by looking at the chart that the musical scale occupies rather a low position in the range of possible audition, being in fact entirely within the lower half. In other words, there are many more notes above the treble clef that can be heard by the normal ear than there are notes below the bass clef that can be heard.

The conversational voice scale—that is, the scale above which or below which no human voice talks in ordinary conversation, corresponds nearly to the musical clefs. No one, even with a deep gruff voice, talks on a lower note than C, in the bass clef, great octave and no one, even with a high piping voice, talks on a note higher than g^2 just above the staff.

It will be seen from this that the lower half of the auditory range is of much greater practical value than the upper half and it is known by us all that this is the very part of our auditory power than suffers in ordinary catarrhal otitis media.

The loss of the high notes is of no practical importance from the patient's standpoint, but is of great value and interest to us as physicians in determining the progress of the deafness and in estimating the prognosis.

There is a place at the top of the chart for the name, date and record number, also spaces for repeated tests occupying the major part of the space on the right. The notes and the number of vibrations per second necessary to produce each are indications in their proper places. In getting the hearing power, I always use the notes of low intensity—as loudly struck forks emit sounds of no diagnostic value. When the lower tone limit is found, I make a dot on the line or space on the chart corresponding to the note and do the same for the upper tone limit. The intervening tones are gone over in search of islands of hearing or gaps and black lines drawn connecting the dots, thus giving a graphic record of the hearing. After inflation or massage, the tests may be repeated to ascertain the improvement or loss and drawn in red alongside the black. Below is a blank space for recording the watch, voice and conduction tests.

It is of interest to note that many of the so-called deaf mutes can really hear quite well in the upper or whistle scale, but can hear nothing in the clef scales or conversational scale.

In presenting this modest effort to the Society, I feel that I must apologize for not bringing out something really complete in itself, but feel justified in the belief that this field of hearing chart which I designed, is a step toward a better and more comprehensive method of making and recording hearing tests.

THE NOSE AND THROAT IN THE HISTORY OF MEDICINE.

BY JONATHAN WRIGHT, M.D., BROOKLYN, N. Y.

(Continued from page 280.)

This at present, of course, does not by any means exhaust the list. In fact the special literature dealing with the nose and throat has now become of such enormous bulk that it is impossible for any one man to peruse anything more than a small part of even the most important books, essays and reviews.

Text Books

Text books as we have seen were rapidly issued and grew quickly from small brochures, their first editions, to the respectable volumes of Türck, Cohen, Fauvel and McKenzie. Of late years the exhaustive composite works, of which Heymann's Handbuch is the most striking example, are monuments of intellectual activity and restless endeavor. In every encyclopædic work on general medicine or surgery, laryngology and rhinology occupy a relatively large number of pages. Since Friedrich's casual remark our knowledge of the diseases of the upper-air passages has increased enormously, and the literature of the subject still more so.

Laryngological Societies.

America claims precedence in the formation of special laryngological societies. The New York Laryngological Society began its sessions in 1873, which, however, were gradually discontinued, and the organization of a throat section in the Academy of Medicine in 1885 practically took its place. The American Laryngological Association held its first meeting in 1879 under the presidency of Louis Elsberg. The International Medical Congress of 1881 established a section for laryngology and rhinology. Other special societies were formed throughout the world somewhat later. Since 1888 they have existed in abundance, but still have a tendency to multiply. Thus was the art of laryngoscopy and the science of laryngology spread throughout the principal countries of the civilized world.

We may now take notice of the great strides immediately taken in the knowledge of the various phenomena of disease of the upper-air passages.

Laryngeal Tumors.

No subject so immediately engaged attention as that of laryngeal tumors. Forming striking pictures in the laryngeal mirror, causing marked and distressing symptoms, capable of immediate relief by means of instruments under the guidance of the laryngoscope,

and last, but by no means least, affording the operator a chance to display in the most brilliant manner his newly acquired skill, the larynges of the civilized world were soon swept so clear of benign neoplastic excrescences, that one is to-day almost tempted to account for their present rarity by supposing the early laryngologists even removed the tendency to their formation. And yet even here we are able to go far back in the history of medicine, and note not only the observations of laryngeal tumors post-mortem, but even their extraction per vias naturales.

Marcellus Donatus* in a vague way doubtless referred to laryngeal growths in the early part of the seventeenth century when he spoke of warts in the throat, fauces and root of the tongue. He says they are rare, but occur at times. Edward Tyson† in 1627 wrote of having diagnosticated a polypus of the bronchi and trachea from the expectoration of fleshy masses by a young man, but he was not able to obtain an autopsy to confirm his diagnosis, and it is not certain he did not observe fibrinous shreds.

Haller‡ refers to a case of an ulcerous tumor of the epiglottis and "three scirrhous and round tubercles seated between the membranes" of the uterus. The epiglottic tumor was of such a size that wonder was expressed that the woman had not died. We may suppose it was an epithelioma.

Lieutaud in the middle of the eighteenth century recorded § observations of two cases post-mortem, in which laryngeal polypi had caused death.

The First Intra-laryngeal Operation.

"A laryngeal polypus which Levret could not ligate with his instrument, G. Köderik, a surgeon in Brussels, ligated with much ease by means of an instrument which was constructed out of a row of hollow balls. This flexible instrument may perhaps be very useful in certain cases in which the stiff catheter renders no aid." ‖

John C. Cheeseman, in 1817, was doubtless the first in America to describe ¶ a laryngeal growth. His is the earliest illustrations of such a growth with which I am familiar. It was a case of papilloma of the vocal cords, dying without relief. Albers remarked ** in 1834 that "tumors in the cavity of the larynx belong to a class

* "De Historia Medica Mirabili," Lib. III, Cap. V, 1613, p. 243.

† "Acta Medica Thomæ Bartholini," Lib., V, p. 94.

‡ "Pathological Observations," 1756, Obs. VIII, p. 14.

§ "Historia Anatomica Medica," 1767, Vol. II, p. 297, Obs. 63 and 64.

‖ This is as explicit a reference as I can find to the first authenticated case of intra-laryngeal operation for a neoplasm. Herbinaux' report in the "Journ. de Med.," Paris, 1770, not being at my disposal, I have it from Lewin's "Deutsche Klinik," No. 13, March 29, 1862, who himself quotes it from Richters "Chirurgische Bibliothek."

¶ "Transactions of the Physico-Medical Society of New York," Vol. I, p. 413, 1817. Case of a remarkable disease of the larynx and trachea, with a plate.

** "Journ. der Chirurgie und Augenheilkunde," 1834, No. 21, Heft, 4.

remarkable alike for their rarity and their characteristic symptoms," and in 1837 Trousseau and Belloc could only report from literature and their own experience seven cases.

Cheeseman's case is omitted from Ehrmann's otherwise apparently complete list of the observations which had been noted up to the date of the appearance of his work in 1850,* including his own two cases, 31 in all. He also reported two cases of laryngeal polypi in horses and three in cows. Ehrmann said something of the structure of laryngeal polypi, dividing them histologically into fibro cellular and polypid excrescences, these latter including what we call papilloma.

Shortly after Ehrmann's paper Horace Green† published a work on the subject. He there speaks of having removed, by means of a knife and a bent tenaculum, a laryngeal polyp from a child of eleven, which he could see by forcible depression of the tongue. He boldly and quickly cut the tumor at its base, certainly a very skillful operation under the easily imagined circumstances. It must of course have been a pedunculated tumor, springing from the upper part of the larynx in a very tractable patient. In another case, that of a man, he used a sponge probang and cauterized the base of what was evidently a polyp. Still another growth which was probably malignant was partly removed by knife and tenaculum.

Middeldorpf‡ succeeded, by means of an incandescent platinum wire loop, in removing in 1853 a polyp which he supposed sprang from the upper part of the larynx. The tongue was forcibly pulled out by a sharp hook, and the tumor was encircled with the wire by means of the fingers. He at this time was able to cite 64 cases of laryngeal polypi before his own. A few only of this number had obtained relief by operative interference, yet some of these as we have seen, were extracted per vias naturales before the days of the laryngoscope. Nevertheless, this was very exceptional and when we realize that Ehrmann spoke the truth in saying, "Polypi of the larynx, left to nature, become sooner or later the cause of sudden death," we are able to appreciate what laryngoscopy did for these sufferers.

The First Intra-laryngeal Operation by the Aid of Laryngoscopy.

Immediately laryngological literature abounded in reports of the diagnosis, intra vitam, of this morbid condition. Lewin, in 1861, declared§ that he had, thus far, seen fifty to sixty cases of laryngeal neoplasms, and that they were present in five or six per

* C. H. Ehrmann: "Histoire des Polypes du Larynx," 1850.
† "Polypi of the Larynx," 1852.
‡ "Die Galvano-Caustik," 1854, p. 222.
§ "Allgemeine Medizinische Central Zeitung," Oct. 12, 1861, p. 654.

cent of all cases of laryngeal affections. He had operated on seven of these, three by cutting operations and four by caustics. Subsequently* in an exhaustive paper he pictured forceps and laryngeal and cautery electrodes. He there states he operated on his first case July 20, 1860, and upon his second case in November, 1861. We must, therefore, conclude so far at least as certain publications indicate it, that Lewin was the first to attempt the extirpation of a laryngeal growth under the guidance of the laryngoscope. Von Brun's title allotting to himself the credit of the first operation therefore is misleading†, though of course he probably knew nothing of Lewin's publication. It nevertheless gave rise to considerable controversy. After long training of his brother's throat, he succeeded in removing a growth from his larynx by means of a forceps. In another work‡ in 1865 he was able to report sixteen cases operated on in various ways.

In 1866, Elsberg published§ a pamphlet on the subject. It was a work of considerable merit, with some very good plates of the microscopical appearances of papilloma, and less good-colored plates of laryngeal growths, *in situ*. In 1867, J. Solis Cohen reported‖ the intralaryngeal removal of a polyp.

The laryngeal knife, which of late has been discarded as a very dangerous instrument, was the favorite weapon of these early operators,¶ who, we may suspect, did not always report their mishaps with it. V. Bruns, however, invented a number of other devices for his work.

So rapidly did the observations of these growths multiply, that by 1871 one man was able to report from his own experience 100 cases. In this year Morell McKenzie published his essay on "Growths in the Larynx," which he differentiated into papillomata, benign epithelial growths, fibromata, fibro-cellular or mucous polypi, myxomata, spindle-called sarcomata, cystic tumors, adenomata, angeiomata. He pictured various intralaryngeal instrument of his own invention, among them his laryngeal forceps, and the devices of others. His observations began in 1862, and in eight years he had seen 100 cases himself, and he was able to collect the reports of 189 cases by others, published since the introduction of the laryngoscope, ascribing the first case to Lewin, in 1860.

* "Deutsche Klinik No. 12," 1862, ff.

† "Die Erste Ausrottung eines Polypen in der Kehlkopfhöhle," von Victor V. Bruns, 1862.

‡ "Die Laryngoskopie und die Laryngoskopische Chirurgie."

§ Laryngoscopal Surgery, illustrated in the Treatment of Morbid Growths within the Larynx, being the prize essay to which the American Medical Association awarded the gold medal for 1865.

‖ Am. Jour of the Medical Sciences, April and October, 1867.

¶ Vid, "Uber Kehlkopfbildungen," Archiv. der Heilkunde, von Dr. Otto Prinz, p. 193 1866.

Many observers treated them by applications of caustics, but this method soon found its proper field of therapy. It is interesting to note in the table of Fauvel,* that he had, up to 1876, seen 300 cases of laryngeal neoplasms, beginning in 1862, when he saw eight, and reaching the lightest figure in 1873, when he saw 40 cases. To the modern observer, even in our largest hospitnl clinics, these now seem fabulous figures. The rapid differentiation of these growths is to be noted in both McKenzie and Fauvel's works. Lefferts† was able, in 1876, to diagnosticate and operate on a case of eversion of the laryngeal ventricles, cases having been previously observed by McKenzie (l. c.) and Moxon.‡

Eversion of the Laryngeal Ventricles.

We have seen that Schneider, Santorini, and Haller had fully described, under a different name, the pharyngeal tonsil. Occasional reference to the structures in the naso-pharynx is to be found in prae-laryngoscopic literature. Thus Luschka§ refers to Mayer as describing, in 1842, the lymphoid tissues in the naso-pharynx as a bursa, and Tourtual had spoken of it as the superior sinus of the fauces. Luschka more accurately described the vault as, "not smooth, but distinguished by numerous larger and smaller depressions and protuberances, and occasionally by a complete labyrinth, made of round or ovoid channels. This appearance of the vault depends upon the existence of many simple and clustered lymph glands," which are arranged in a manner similar to the faucial tonsil. Later, in another publication,‖ he described the pharyngeal tonsil more particularly, and proposed that name for it.

The Pharyngeal Tonsil.

Henle¶ spoke of depressions and blind dilitations in the mucosa, little cavities here and there to be found in the mucous membrane of the naso pharynx. He admitted the existence normally of Mayer's "Bursa Pharyngea." Such a conception led much later to the exaggeration by Tornwaldt of these occasional pathological conditions into a constant factor in the etiology of post nasal catarrh, his configuration of the tissue being still known under the name of "Tornwaldt's Disease"**. While it is possible that the cases observed by Loewenberg†† and more probably the cases observed by Voltolini‡‡ were really adenoids, this does not detract in the slightest from the originality of Wilhelm Meyer's great clinical discovery.

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* Traite Pratique des Maladies du Larynx, par. Dr. Ch. Fauvel, 1876.
† Med. Record, 1876, p. 359, Vol. XI.
‡ Trans. Path. Soc., London, 1868, p. 65.
§ "Die Anatomie des Menschen." Der Hals, Bd. I, p. 210, 1862.
‖ "Der Schlundkopf des Menschen," V. Hubert, V. Luschka, 1868.
¶ Handbuch der Systemat. Anat. des Menschen Die Eingeweidelehre, p. 83, 1866.
** Ueber die Bedeutung d r Bursa Pharyngea, 1885.
†† Archiv. f. Ohrenheilk, 1867, p. 116, Vol. 2.
‡‡ Die Anwendung der Galvano-Kaustik, etc., 1867, p. 66.

Wagner in 1865* had described the anatomical structure of what he called "Pharyngeal Granulations."

Wilhelm Meyer.

Wilhelm Meyer had reported his observations on this lymphoid hypertrophy, in Copenhagen, in 1868, and later published in London† his paper "On Adenoid Vegetation in the Naso-Pharnyngeal Cavity." It is difficult to find, in the annals of medicine, a first report of a morbid process which so thoroughly in one essay exhausts the subject from almost every point of view. So common that, after his attention had been drawn to the condition, he was able to detect it in 102 cases in eighteen months, with symptoms so characteristic that the veriest tyro in medicine now easily suspects their presence at a glance, with certainty of relief so quickly afforded by a simple surgical procedure, it certainly seems marvelous that the condition should have been so long undetected. The practice of post rhinoscopy had failed to reveal it. Notwithstanding that Czermark and his followers for ten years had been accustomed to explore by vision the cavity of the upper pharynx, it was left to an observer comparatively unfamiliar with post rhinoscopy to detect it with his finger. In seeking for the cause of an eustachian catarrh in a patient he pushed his finger above the velum palati and thus became aware of a morbid growth, the removal of which has alleviated as much suffering and prevented as much disablement, as any surgical procedure which was ever devised by the wit of man. Not only by his thorough exposé of the whole subject did Wilhelm Meyer thus confer an inestimable boon on suffering humanity, but he has furnished a subsequent generation of rhinologists with their most lucrative source of income. No other event since the discovery of the laryngoscope has so contributed at once to the glory and the profit of the specialty of laryngology. With much more reason then than Tagliacozzi's contemporaries and followers gazed upon his statue in Bologna, may the modern rhinologist and his patient alike, with unstinted reverence, view the figure of Wilhelm Meyer, as it stands, erected by them in 1898, in the "Gefion Platz" in Copenhagen. While only five cases had been previously noted, and while Waldeyer and his followers have subsequently further elucidated the histology of lymphoid hypertrophy, nothing of vital importance remains to be said of the history of "Adenoids" after Wilhelm Meyer.

It seems at first glance somewhat strange that the study of nasal disease should not have more attracted the attention of physicians even before the discovery of the laryngoscope. Nasal operations had

* Archiv der Heilkunde, p. 318, 1865.
† Medico-Chirurg. Transactions, 1870, Vol. 53.

been performed, as we have seen, since the beginning of medical annals. The Hindus, Hippocrates, the Arabians, Aranzi and his followers, were accustomed to perform anterior rhinoscopy, and one would naturally think some device would have been adopted for the efficient illumination of the internal nose. We have seen that Hippocrates used a canula for intranasal cauterization, and one wonders that this did not sooner develop into a nasal speculum.

Nasal Specula

Guy de Cauliac referred to a device of Haly Abbas which we have noted, a "speculum ad Solem," which may have been used for dilating the nostrils, but from certain passages in the Arabian authors as well as in his own works, I can not but suspect that this old master surgeon of the Middle Ages misinterpreted his perhaps faulty transcript of the original manuscript. Recent scholarship* has unearthed a significant passage in the works of Arnold of Villanova (1240-1313). If one will turn to the place indicated†, one will find the author describing very carefully and minutely the symptoms of leprosy and the physical appearances of the face, eyes, etc., in these cases. He then goes on to say: "Likewise they are to be known from the wound (ulcer) existing in the nostrils, and these should be examined more deeply; for which purpose one should take a *small bifurcated branch of wood like a forceps*, and this should be placed in the nose, opening it, and one should look in with a lighted candle and if ulceration or excoriation is seen well in the depths of the nose, that is a reliable sign of leprosy and one which will not be recognized except by the well instructed." It is plain, therefore, that one of our modern forms of nasal specula was formed from the fork of a tree branch by the doctors of the Dark Ages, and we incidentally receive another hint as to obscurity in the differentiation of disease.

From time to time in the works on surgery mention may be found and some illustration noted of nasal specula, chiefly devised for protecting the nose from the incandescent iron. Thus Garengeot‡ pictures a speculum nasi through which hot cautery irons may be thrust to sear the os unguis in order to destroy it. "Ainsi voila son usage expliqué." Dionis in his work on surgery§ depicts an instrument which is still occasionally called by his name, and is, in metal, practically the counterpart of the device of Villanova in wood.

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* Archiv. f. Laryngologie Bd. XI. Heft. 3, p. 482.
† Opera Arnaldi de Villanova, 1509, f. 204, Signa Leprosorum.
‡ Traite des Instruments, Tome II, p. 12.
§ Edit. 1716, p. 479, Fig. xxxvii, E.

Neglect of Nasal Disease.

We have reviewed the separate works of Deschamps, Cloquet and Piorry, on the nose, and have seen that knowledge of intra-nasal disease was fully abreast if not somewhat in advance of the knowledge of laryngeal disease up to the time of the fruitful labors of Czermak and Türck. The next fifteen years were almost exclusively devoted to the development of the knowledge of laryngeal morbid conditions as revealed in the laryngoscope, and to the technique of operative interference. In the first edition of Solis Cohen's book on Diseases of the Throat in 1872, containing more than 200 pages, scarcely 90 are devoted to diseases of the nose. In 1879 twenty pages were added in the second edition, but little or nothing of this extra space was devoted to the nose. A reference to any one of the recent text books, Lennox Brown's last edition for instance, will show that the proportion has been more than reversed in the thirty years of the active evolution of our knowledge of the normal and abnormal states of the upper air passages. In the first edition of Cohen's work, just referred to, the 90 pages are taken up with a consideration of Epistaxis, Coryza, Ozœna, the nasal douche, Anosmia, foreign bodies, nasal polypi, for the removal of which the use of the nasal forceps was still advised. He does little more than refer to affections of the accessory sinuses. Spencer Watson and Michel, in 1875, published brochures on diseases of the nose, the latter being translated into English by Shurly in 1876, but it was after 1880 that the impulse to the more exhaustive study of intranasal phenomena began, and in another ten years the number of journal publications dealing with the nose and naso-pharynx had already exceeded in number those referring to the larynx and air tubes. Notwithstanding the enormous increase in all departments of the literature of our specialty, this discrepancy has continued to gradually become more marked*.

Revival of Interest in Nasal Disease.

Reflex Neuroses.

The first marked evidence of this awakening to the importance of nasal phenomena may be seen in the history of the interest aroused in reflex nasal neuroses. Certainly no other subject was so calculated to stimulate inquiry into all manner of nasal lesions. How grossly, after a few years, this subject was exaggerated and distorted is apparent, now that the exaggeration is decreasing. Notwithstanding the fact that John N. McKenzie† has pointed out that spasmodic affections of respiration had been noted by Coelius Aurelianus, Galen and many other subsequent writers in the prae-rhino-

*A reference to the summary of the literature in the first issue of each year of Semon's Internationales Centralblatt für Laryngologie will make this evident.

† Trans. Am. Lar. Ass'n, 1886-7.

scopic era, Voltolini* was the first to note the phenomena at a time when the local conditions in the nose could be carefully studied by actual inspection. Voltolini drew attention to the intimate connection between asthma and nasal polypi, and asserted that he had seen the asthma disappear on the removal of the polypi. He referred the idea of reflex action from the irritation of the mucosa back to the physiology of Johann Müller, and we have seen the matter discussed in the lectures of Marshall Hall, in 1836. The beginning of the development of our knowledge of the erectile tissue in the nose, dates back to the brief paper of Kohlrausch,† who, in 1853, spoke of the cavernous tissue of the nasal mucosa, especially of the posterior border of the inferior turbinated bones, which we have seen Morgagni had described as of a glandular nature. Although Kohlrausch seems to have had the right conception of their essential nature, his methods of demonstration were very crude. Scarcely less superficial were the plates of Bigelow, in 1875,‡ who was misled somewhat, apparently by having blown air into the submucous tissues, and regarding these emphysematous spaces as blood channels. He, however, pointed out more intelligently the structure and erectile nature of this tissue. Both Kohlrausch and Bigelow refer to Hyrtl as having previously noted this cavernous condition of the mucosa, but I am unable to find anything more than a cursory reference by him to the vascularity of the mucosa in this situation.§ It remained for Zuckerkandl,‖ whose work may be profitably consulted for a much fuller history of the subject, to more completely and satisfactorily elucidate the real structure. The evident dependence of the congestion of this erectile mucosa upon reflex action connected it, not only with the neuroses of hay fever and asthma, but with the histological changes in the stroma. A perusal of the subsequent literature will again reveal the process of differentiation in nasal affections, as we have so frequently had occasion to note in the course of this history. Schaeffer¶ had drawn attention to local disease of the upper air passages as an exciting cause for asthma and other neuroses, but it was not until the publication of W. Hack's** paper on "Reflex Neuroses," in 1882, that the attention of laryngologists was arrested. There followed a large number of contributions to medical literature by

Erectile Tissue in the Nose.

* Der Galvanokaustik, 2d Aufl., 1872.
† Müller's Archiv. f. Anatomie, Physiologie, etc, 1853, p. 149.
‡ Boston Medical and Surgical Journal, April 29, 1875, No. 17, p. 489.
§ Vid: Hyrtl's Topographisce Anatomie, Ed., 1847, Bd. I, p. 212.
‖ Normale und Patholog. Anah. der Nasenhöhle, Bd. I, 2te Aufl., 1893.
¶ Deutsche Med. Woch., Nos. 32, 33, 1879.
** Berl. Klin. Woch., Vol. XIX, 1882, p. 379.

Elsberg,* John N. McKenzie,† Roe, Daly, Bosworth, and many others. They elaborated this chapter in laryngology to an extent which now seems overdrawn, much more prominence being given to local conditions than to the underlying systemic neurosis in the etiology.

Intra-nasal Surgery.

This immediately stimulated an interest in intranasal surgery, and no one can now deny that, for a while, the nose was a much abused organ. Chronic hypertrophy of the mucosa was perhaps the lesion which first attracted the chief attention. We have seen that the treatment of nasal obstruction, due to hypertrophy of the mucosa, by means of nasal bougies, had been recommended by Deschamp and Cloquet in the beginning of the century, and we find this method again proposed in America at the beginning of the development of modern rhinology.‡

Caustics and Cautery.

The application of acids which we have seen in the records of ancient medicine, was one of the sheet anchors of intra-nasal therapy, but later was much neglected. Now it sprang suddenly into favor, some of the weaker acids, such as chronic or chloracetic, being found preferable to the painful action of the stronger mineral acids. Soon, however, these caustic applications give place in a large extent to the actual cautery, a still older therapeutic measure, as we have seen in the Hippocratic treatises, but now the hot metal, by means of the electric current, brilliant illumination, and cocaine, had become much more manageable in its application. The introduction of this method of cauterization goes back in prae-laryngoscopic times to the work of Middeldorpf, who in 1854 published§ illustrations of a cautery armamentarium practically the same with which we are now familiar. Voltolini in 1867 (l. c.) further developed the technique by the aid of laryngoscopy. He also was the originator at this time of electrolysis in various affections of the nose and throat. The improvement in the source of the electric discharge soon brought the method of galvanic cauterization into universal use. An ingenious operation frequently needs only the recommendation of novelty, and Michael's amusing little poem entitled "Rhinologie," read at the International Congress of 1890,‖ shows that even by that

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* Trans. Am. Lar. Ass'n, 1883, p. 79.

† Am. Jour. Med. Sc., July, 1883.

‡ In a report of the proceedings of the New York Laryngological Society, we find Asch, Wagner and Smith advising the use of intranasal bougies, in hypertrophy of the inferior turbinated bone. N. Y. Med. Jour., Vol XIX, 1874, p. 422.

§ Die Galvano-Caustic, von Albrecht Theodor Middledorpf, 1854.

‖ Vid. Centralblatt f. Lar. VII, p. 133.

time intranasal cauterization was becoming a little ridiculous. For almost every affection of every organ, from the uterus to the eyes, after the spread of Hack's ideas,

"Dann wird die Nase ausgebrannt,
Denn das hilft immer wie bekannt."

The Dental Engine.

Other methods of removing intranasal obstruction came rapidly into use. The dental engine seems to have first been used by Solis Cohen.* He destroyed an exostosis of the nasal passage by this means in 1878. Seiler seems to have been the first to suggest the use of the electro-motor for driving the dental engine in this operation†. After the introduction of this adjuvant, the apparatus became a part of the armamentarium of every laryngologist, at least in America, though much later in Europe. In 1887 Bosworth reported his invention of a nasal saw for septal ecchondroses‡ and this method of their removal was so practical that its performance immediately became very common.

The Nasal Saw.

The Nasal Snare.

We have already followed the history of the nasal snare down to the 19th century, and we have to note one more reproduction and modification of Hippocrates' loop, before we reach the Jarvis' Snare. It is that of William Robertson§. He used harpsichord wire which however did not run through a canula but through lateral guides at the side of a steel post.

Jarvis' chief improvement‖ over the snare of Fallopius consisted in the method of drawing the wire through the canula. He made use of an outer canula at the distal end for the attachment of the wire and the adjustment of the milled nut to a screw thread on the inner canula, by the use of which the loop could be powerfully, accurately, and slowly tightened. This immediately made the nasal snare the most efficient instrument for the removal of soft intranasal tissue, and the numerous subsequent modifications testify to the fact.

Cocaine.

All this activity and zeal for the removal of intranasal tissue would have been very much less had it not been for the epoch making discovery, by Carl Koller in 1884¶, of the surgical possibilities of cocaine. The three greatest events in the history of Modern Laryngology and Rhinology are the demonstration of the utility of the laryngoscope by Czermak and Türck, the observation of adenoids by Wilhelm Meyer, and the advent of cocaine. Its use in laryngology was introduced by Jelinek**. The impunity, so far as

* The Medical and Surgical Reporter, July 13, 1878, Vol. 39, p. 30.
† Diseases of the Throat, Edit. 1883, p. 248.
‡ Medical Record, January 29, 1887.
§ Edinburgh Medical Journal, Vol. I, 1805, p. 410. Fig. p. 404.
‖ Trans Am. Lar. Ass'n., 1880. p. 130.
¶ Wiener Med. Woch 1884. No. 43. p. 1276, seq., N. Y. Med. Journal, January 3, 1885, p. 19.
** Wiener Med. Woch, No. 45. 1884, p. 1332.

pain is concerned, with which the mucous membranes of the nose and throat may be burned and lacerated, has done perhaps more than anything else towards the development of the technique of laryngology. A merciful Creator having invented pain for the protection of the tissues of the animal world, its abolition by the ingenuity of man has been necessarily followed by much ruthless and unjustifiable destruction of them, but nevertheless among drugs cocaine ranks only second to the general anaesthetics in the mercies vouchsafed to the human race.

Inhalations. and Detergents.

When we seek the origin of the local topical treatment of catarrh of the upper air passages by detergents we are immediately transported far back into the misty records of Hindu medicine, and the same may be said of inhalations. We need not trace these through the intervening ages, but, after the incidental references which have found their way into the foregoing pages, I am sure the reader will not regard the taunt of the Frenchman altogether without its sting. "Tout ce que les mèdicins moderns ont fait pour guerir le rhume de cervean, ç'a été, de l'appeler Coryza." Had he been familiar with medical history, he would not have been ready to concede us even that meagre praise.

The compressed air spray seems however to have really been an invention of a comparatively recent date, but we are compelled to seek distant fields for the history of the actual inception of that idea. Galen is said to have prophesied we would some day succeed in isolating the Pneuma in the atmosphere which is taken into the blood in respiration. We have noted the observations by Lower and Mayow in the 17th century. Priestly, in actually isolating oxygen from other substances, scarcely knew more of it, still terming it Deplogisticated Air, than did his predecessors in the 17th century,* but the time was ripe for its elucidation, which quickly followed under the admirable and accurate experimentation of Lavoisier. He was the first to give it the name of Oxygen† in 1777. This very soon aroused great interest in the gas as a medicinal agent, and devices were adopted for its inhalation by Beddoes and Watt in 1796.‡ Some years before this John Mudge§, knowing nothing of the pulmonary residual air, nor of the ciliated epithilium advised the inhalation of steam, combined with opium, with the idea that the medicament would thus reach the ultimate bronchioles. His apparatus was very much like

* Priestly: "Experiments and Observations on different kinds of air."—London, 1775.
† Comtes Rendus de l'Academie des Sciences, September 5, 1777.
‡ Considerations on the Medicinal Use and on the Production of Factious Air, 1796.
§ A Radical and Expeditious Cure for a Recent Catarrhous Cough, 1782.

the present croup kettle with a flexible tube. When Davy announced the existence of residual air in the lungs the significance of it was immediately appreciated by Majendie, who comprehended the impossibility of thus applying medication to the ultimate ramifications of the pulmonary tree.

The Compressed Air Spray.

The idea of the use of sprays in the air passages seems to have originated at one of the French baths. Some apparatus for spraying the body had been in existence for some years when it occurred to Dr. Auphan, in 1849, to utilize it for inhalation. Sales-Girons succeeded in inventing a portable apparatus for the purpose. It was a very awkward affair, somewhat on the principle of some of the present inhalation globes. A fine stream was broken into particles by being thrown with force against a concave surface. Mathieu, Bergson, and others improved this somewhat, and finally the latter conceived the idea of breaking the stream of water into a spray by a blast of air or steam blown across its exit from a narrow tube. This of course necessitated the employment of compressed air. This ingenious invention, under various names and modifications, was received with great enthusiasm by the budding specialty of laryngology. The mucous surfaces were deluged with all sorts of drugs suspended in watery and oily media. The futility of much of this sort of therapy has gradually become apparent, but since the introduction of antiseptics it has found its place in laryngological practice, not its least virtue consisting in impressing the patient with the resources and skill of his doctor. At first attempts were made to use warm sprays, but as early as 1861, Demarquay* drew attention to the fact that watery sprays have approximately the same temperature after they are nebulized, whatever may have been the previous temperature of the fluid. I find the use of nebulized sprays first recommended in America by Solis Cohen in 1866†.

Improvements in Illumination.

Besides the great strides made in operative technique, fewer advances have been made in the art of Rhinoscopy and Laryngoscopy itself. Intensification of illumination was obtained in the early history of laryngoscopy by the use of the oxy-hydrogen lime light, the idea beginning, as we have seen, with Voltolini, while in Fauvel's book‡ the more perfect apparatus of Drummond was recommended for the purpose. French has used Aranzi's idea, a ray of light

* Bulletin de l'Academie Imperiale de Medicine T. xxvii, 1861-2, p. 26.

A fuller account of the history of sprays may be found in Lewin's book "Inhalations Therapie," to which I am indebted for some of the above information.

† New York Medical Record, p. 147, 1866-7.

‡ Traité Practique des Maladies du Larynx, 1876.

reinforced by a water lens, and found the best illumination in the rays of the sun thus intensified. His application of the arc light to the purpose is also very efficient, he having adopted both these expedients in his photographs of the larynx and naso-pharynx.* Turck† and others had attempted to magnify the laryngoscopic image by means of lenses and concave mirrors, and Hirschberg,‡ later, attempted the same thing. These attempts have proved of no practical value. By means of stroboscopy, Oertel,§ in 1878, showed the wave lines of different tones in the vibrations of the vocal cords.

Transillumination.

Transillumination of the tissues, which had been suggested by Voltolini, was applied to the examination of the accessory sinuses, in 1887 and the following years, by him and many others, when diseases of those cavities began to attract more careful study. The electric lamp has made this original idea of Voltolini a valuable aid in rhinoscopic diagnosis. Lastly, we have to note the method of Kirstein, of direct inspection of the larynx, which promises to be, however, of very limited application,‖ and one which had already been, to some extent, anticipated again by Voltolini, in 1872.¶ Indeed, to Voltolini is to be attributed a much larger proportion of original ideas in the development of the specialty of laryngology than to any other one man. In this fertility of resource he scarcely has had a rival in the history of our subject.

* Vid. Trans. Am. Lar. Ass'n, 1882, 1883, 1886, 1888, 1896.
† Zeitsch. der K. K. Gesell. der Aertzte zu Wien, No. 52, 1859, p. 817.
‡ Virchow's Archiv., 1877, No. 69, p. 146.
§ Centralblatt f. die Medicin. Wissenschaft, 1878, p. 99.
‖ Berl. Klin. Woch., 1895, No. 22.
¶ Die Galvanokaustik.

Deformities of the Nasal Septum and their Treatment by Means of the Electric Trephine.—LANDAU (Jour. Med. de Bruxelles, No. 41, Oct. 10, 1901).—*Revue Heb. de Laryngol., D'Otol., et de Rhinol.,* Dec. 21, 1901.

The author advises the reduction of the septal spur or ridge by making a succession of perforations with the electric trephine and then smoothing the uneven surface left by means of these openings. (A method advocated many years ago by Dr. Holbrook Curtis.)

W. SCHEPPEGRELL.

PNEUMATIC MASSAGE IN AURAL PRACTICE.*

BY EDWIN PYNCHON, M.D., CHICAGO.

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At a meeting of the Sixth International Otological Congress, held in London, August 11, 1899, the Lenval prize was awarded to Dr. Charles Delstanche, of Brussels, on account of his devices for oto-pneumatic massage which were regarded by the jury as being so material an assistance in the practical treatment of affections of the middle ear as to merit this award.[1]

No stronger indorsement than the above could be desired as to the recognized merit of pneumatic massage in aural practice.

In the treatment of this subject it becomes necessary to briefly consider all forms of massage employed in the treatment of diseases of the ear, of which pneumo-massage may be said to be the middle register, with the pressure probe as bass, and phone-massage as high register. They each have their proper field. Lucae[2] has for years advocated the use of the pressure probe. Lester[3] has modified this method by having the pressure probe attached to, and operated by, a tiny electric motor, so as to give a rapid, short stroke, 1-16 inch from center, for from three to ten seconds. In pronounced cases wherein the ossicles are firmly bound down by adhesive bands, Bishop[4] has employed an ossicle fork, one prong of which is introduced back of the handle of the mallet through a previously made slit in the drum head, while the other prong is outside thereof, and thus strong enough traction is made to break up the adhesions.

As air is the natural medium for conducting sounds through the auditory canal to the middle ear, it would seem most rational to make use of pneumatic massage which, in its simplest form, is done by producing suction with the moistened finger tip applied to the external opening of the auditory canal.

Hand massage, as with a Siegle pneumatic speculum, or a Delstanche masseur, has been extensively employed by different otologists, and particularly by those who have found that the results from hand massage were equally as good, or even better, than when such mechanical devices as were available had been used. In this

*Read at the Seventh Annual Meeting of the Western Ophthalmologic and Oto-Laryngologic Association, Chicago, April 10-12, 1902.

progressive age, wherein machinery is supplanting hand labor in so many fields, it seems apparent that a properly constructed device, which perfectly gives the several modifications of the massage air current, should easily supplant manual treatment which, of necessity, cannot be administered without variation or fatigue during a seance of several minutes' duration. Furthermore, the doctor's time is too valuable for him to be doing in a mediocre manner that which a properly constructed machine can do much better than he possibly can. The therapeutic effects to be obtained all hinge upon the mechanical details whereby all possible variations of the air current can be produced.

The electric current for medical use is guaged and regulated by means of the milleampmeter, the pole-changer, rheostats, rheotomes and transformers in order to secure all of the available physical properties and variations thereof. In like manner in order to secure the maximum results to be derived from pneumatic massage it is necessary for the mechanic to first furnish means for securing all of the desirable physical properties of the air column or current employed, which may be summarized as follows:

A. The character of the air current.
   1. Simple vibration.
   2. Aspiration with release.
   3. Continuous aspiration.
   4. Compression with vibration.
      using a. Plain air
      - or b. Medicated nebulae.

B. The length of stroke of the pump piston.

C. The rapidity of the strokes.

D. The force or gentleness of the stroke—which latter is secured by the use of an air rheostat.

E. The amount and character of the accompanying noise (phone-massage).

F. The length of the seance of treatment.

G. The frequency of repetition of treatments.

H. The duration of the course of treatment.

In Considering the Character of the Air Currents employed the first one noted as that of simple vibration is the one which has been most often employed. The next one mentioned as that of aspiration with release is one whereby successive rarefactions are intermittingly produced, but without alternate compressions as with the preceding current. In other words, after each suction from

the upward stroke of the pump piston, a valve is released so that the downward stroke operates freely upon the outside air. In this way after the drum head is drawn forward by suction it returns by its own elasticity. This current should not be used at a greater rate of speed than 150 V per minute, as when above this rate it "loses its distinct, exhausting and releasing character, as the two begin to run together, owing to the elasticity of the air,"[5] and it thus becomes a continuous aspiration. For its primary and principal use the slower vibrations, 30 to 90 V, can with the greatest advantage be employed. When this current is being used the patient should be directed to swallow every few seconds. By having this current available there is never any necessity of "starting on the exhaust stroke," the importance of which has been so frequently mentioned by different writers, for when using the simple vibratory current the stroke should be so short that the position of the piston is immaterial. The third current is that of continuous aspiration employed in suppurative otitis after the perforation has taken place, and care should be given that the stroke is neither too long nor too rapid.

The fourth current, designated as that of compression with vibration, is the ordinary air pump, the air current from which can, if desired, be medicated by being made to pass through a hand nebulizer and can then be employed either for inflation through an Eustachian catheter, thereby giving intra-tymphanic massage, or to force a nebula inwardly through the external auditory canal in chronic suppurative cases, wherein the drum head is freely perforated, as has been advised by Stillson.[6] For this use a long, rapid stroke is required.

The Length of the Stroke of the pump piston varies with the air current being used, and should be shortest with the simple vibratory current. It should at no time be of sufficient length to cause discomfort to the patient, and should generally bear an inverse ratio to the speed being used, viz.: the stroke should be shortened as the rapidity thereof is increased. With the aspiration with release current a long stroke will be tolerated, and with the compression current both a long and rapid stroke will be required in order to produce a nebula.

The Rapidity of the Strokes. As is elsewhere elaborated it is only the slow stroke that produces true massage, and its effect is chiefly operative upon the conductive mechanism. As the speed is increased, the stroke meantime being shortened, its effect ex-

tends more to the labyrinth, though when ossicular rigidity is marked, in combination with an atrophied drum head, the rapid jar of the short stroke tends to produce ossicular movement far more than would a long, slow stroke and is furthermore not damaging to the drum head.

The Force or Gentleness of the Stroke. Plumbers make use of an air cushion in order to avoid the noisy jar which would otherwise occur when the outlet valve at the washstand is suddenly closed. In the same way the force of a vibrating air current can be modified by the introduction of a similar device. I have for several years made use of a hard rubber piston syringe,[7] which is attached to the ear piece and through which the jar of the air current can be lessened at will by withdrawing the piston so as

Fig. 1. Oto-Pneumatic Masseur (½ size).

to increase the amount of imprisoned or residual air. Another material advantage derived from its use is that of slow and forcible exhaust in order to overcome the drum-head retraction in combination with the rapid vibrations.

Stillson[8] has described a similar device whereby the drum-head is "held forward by the elastic expansion of a soft rubber ball previously compressed." I have found, owing to the unavoidable leak in an apparatus of this kind, that a continuous rarefaction cannot be maintained, and hence the operation of the piston syringe gives far better results. On the exhaust stroke the hole (A, Fig. 1) is closed by the operator's finger, while on the down stroke this hole is left open. This device is used most often with the simple vibration air current and is attached to the pump hose at B. While in the illustration a fitting for only one ear is shown it will give an economy in time if a double ear-piece, like a bin-aural stethoscope, be employed when both ears are to be treated. In such case the exhaust syringe had better be attached at the point of bifurcation.

In order to produce an even pressure when using an electric masseur, Lucac punctures the rubber tube close to the ear by making a small hole with a red-hot needle.[2] Inserting the ear-piece loosely in the ear is another method whereby the force of the pump

stroke has been softened. Neither of these methods would seem to be as exact as is the use of an air rheostat.

The Length of the Seance of Treatment varies with the sensitiveness of the patient, and may range from ten or fifteen seconds up to several minutes. Lautenbach[9] reports the use of massage in one case twice daily, three hours at each treatment, and continued for five days when she "heard a clock at over two inches." In acute cases the seance should be brief, while in old "chronic-non" cases a treatment extending from fifteen to thirty minutes is to be advised.

The Frequency of Repetition of Treatments. In acute cases, and at the beginning of a course of treatment in old or chronic cases, a daily seance is to be advised, which, after a while, may be changed to every second, and later to every third day, though if the matter of expense is of no importance with the patient, daily treatments had better be continued in order to insure the greatest progress.

The Duration of the Course of Treatment is only to be considered with chronic cases as acute cases will naturally discontinue when they recover. In case of the former the results should be noted every two or three weeks and treatment persevered with as long as progress is being made, which is often so gradual as to require several months' time. A return to treatment should always be earnestly advised when any degree of retrogression is detected after a period of discontinuance.

As writers upon the subject of mechanical oto-pneumatic massage have generally been remiss in not giving the several minor details which are so essential for its proper use, I have taken the liberty of enumerating the more important features. Furthermore, in order to show the different practices of different practitioners, I will tabulate the deductions of a few who have been sufficiently clear to quote as regards these matters of detail.

While I have for several years been employing pneumatic massage through the use of both mechanical and hand exhaust devices, I have been constantly appreciating their shortcomings and have thereby been led to believe that the results derived from such treatment might be more uniformly beneficial were the several patent deficiencies in the devices used suitably overcome. I have recently succeeded in inducing the Victor Electric Co. of this city to so modify their excellent pneumatic massage pump that it will comply with the requirements previously outlined. Furthermore, the

means adopted for instantly separating the pump from the motor, by the simple swinging of a lever, which operates an eccentric axle.

AUTHOR.	Length of Stroke.	Strokes per Minute.	Length of Seance.	Repetition.	Duration of Course.
Stevenson, (10)	¼ to 1¼ inch	30 to 60	Up to 30 min.	?	?
Lautenbach, (11)	½ in. and 1 in (?)	40 to 300	20 min. to 3 hrs.	Daily or less often.	3 Mos.
Jackson, (5)	½ in.	100 to 200	15 to 30 secs.	3 Times weekly.	?
Seiss, (12)	Up to 1 in.	60 to 720	?	Daily or less often.	2 to 4 Weeks.
Ostmann, (13)	2 to 4 m m	600 to 1200	10 to 25 min.	Daily.	3 Mos.

greatly improves the outfit as a cautery transformer, and when the use of the pump is again desired by swinging the lever back the pump starts at the same length of stroke as existed before the disconnection.

The Length of Piston Stroke can be varied from 0 to 1¼ inch, and the exact length of stroke desired can be selected by a guage attached to the crank-pin. The rapidity of the piston stroke in my apparatus varies from 40 to 600 V per minute, though owing to variations in the voltage of the electric current by which the motor is operated, and furthermore to variations in the diameter and quality of the wire used as resistance in the transformer, a slight variation in speed will always be observed when comparing the several motors made at one time, all of which were intended to be alike.

It is principally in the treatment of the so-called "chronic-non" cases—the non-suppurative catarrhal otitis with ground-glass drumhead, which is so often the forerunner of sclerosis, wherein pneumatic massage is indicated, to improve the hearing and additionally to control or diminish the accompanying tinnitus which is probably most often due to labyrinthal pressure and has been tritely compared by Spear[14] with the "seeing of stars when the eye is pressed,"

as tinnitus is produced whenever the tension within the labyrinth becomes greater than normal from pressure within, or from changes in the external ear, or the middle ear, with pressure from without. Vertigo, another symptom occasionally complained of, is also at times a result of pressure. Through its favorable effect

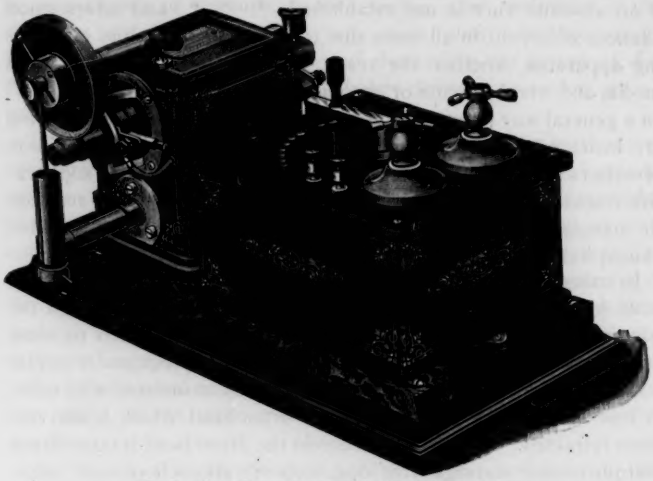

Fig. 2. Victor Transformer with New Massage Pump.

upon the cause—middle ear adhesions, etc.—pneumatic massage is often beneficial in both of these conditions. It also assists greatly in the correction of itching of the external auditory canal, and furthermore is generally instrumental in increasing the secretion of wax when the canal has become too dry, both conditions being concomitant with chronic catarrhal otitis media. Additionally, in hypertrophic cases, inflation by the Politzer method soon becomes more easy of execution.

In the treatment of middle ear cases the aim should be to cause the defective ear to assume, as far as possible, the physical character of the normal ear, and most important of all to increase the ossicular mobility. Passive flexure of ankylosed joints in other localities being the most valuable method of treatment, it would seem reasonable that a similar treatment, suitably modified to conform to the local conditions, would give the greatest promise of benefit. In addition to causing motion of the ossicles by breaking up adhesions, and absorbing hyperplastic deposits, massage stim-

ulates and improves the circulation in all of the middle ear structures, thereby increasing the nutrition thereof. For this latter effect the short, rapid, simple vibratory stroke is most efficient.

As forcibly stated by Jackson[5] pneumo-massage "frequently arrests the onward march of a progressive difficulty of hearing even if an absolute cure is not established * * * and offers good chances of benefit in all cases due to defect of the sound conducting apparatus, whether the result of purulent or catarrhal otitis media, and whether acute or chronic, hypertrophic or hyperplastic." In a general way those who hear better in a noise (paracusis Willisi) are benefited by pneumatic massage. The concensus of opinion of writers upon this subject is that deafness occasioned by suppurative disease of the middle ear is peculiarly favorable in its reaction to massage. Seiss[12] states that senile deafness can be retarded almost indefinitely.

In cases of this class the conducting mechanism is primarily at fault, hence the trouble is essentially in the middle ear, though the labyrinth is quite prone to becoming secondarily affected to some degree. In these cases the chief objective symptom under ocular inspection is impaired mobility of the ossicles, associated with more or less dullness and thickening of the drum-head, which is also oftimes retracted. It is in cases wherein the drum-head is most dense that pneumatic massage with long, slow vibrations is of most value. On the other hand when the m. t. is thin or atrophied, suction may add to the trouble without moving the ossicles, hence in this condition a very short and rapid stroke should be employed.

As regards the value of pneumatic massage in acute inflammatory troubles of the middle ear authorities differ. On the one hand Seiss thinks it contraindicated in cases accompanied by any active inflammatory process. In similar conditions Burnett[15] advocates maintained rarefaction with a Siegle pneumatic speculum so as to thus maintain traction upon the m. t. and its tensor. Lautenbach[9] uses vibratory suction in acute cases as soon as possible in order to avoid adhesions.

Pneumatic massage has proved of value in suppurative conditions of the middle ear, particularly in cases of long standing, and when employed in addition to the usual line of treatment, will often greatly expedite a cure, owing to its mechanical effect in jarring or drawing down discharges from the attic. In the treatment of this condition either the continuous aspiration current or the aspiration with release current should be employed with a piston

stroke of such length and force as to not cause annoyance to the patient, and continued for about five minutes. Following this, and later on when cleansing is less required, the strokes may be shortened and the rapidity increased so as to give greater stimulation, say ⅛ inch simple vibration at 300 V for thirty seconds or longer. In recent cases of suppurative otitis media, *after perforation of the drum-head had been produced,* a very short, slow vibratory stroke may prove beneficial in the way of shortening the period of discharge and by preventing the adhesive formations which are so prone to occur.

For the welfare of the patient all other well-known methods of treatment should be simultaneously employed, as care for hygienic surroundings, general medication when indicated, tympanic inflations, and particularly an aggressive attack upon any and all malconditions of the nose and upper throat which may be present, in order to correct the chronically inflamed or catarrhal condition of the mucous membrane of the nasal passages and fauces, which, through continuity of tissue, is such an important etiological factor in a very large majority of all ear diseases. It is after the correction of these nasal and faucial abnormalities when pneumatic massage *added to the other treatment* may give the most favorable results.

As the cause of all sounds heard by the ear is due to motion noises, as of musical instruments, etc., have been employed to secure motion or vibration of the drum-head and ossicles, such process being known as phone-massage. Reports upon the use of phone-massage alone have been quite varied, and upon the whole unfavorable. This is quite likely in part due to the character or unnatural combination of sounds so often employed. Those who have had most experience therewith do not use phone-massage alone, but generally in combination with pneumo-massage.

It would seem rational to expect most of phone-massage in the treatment of labyrinthal deafness, though as such cases are almost invariably complicated by or secondary to middle ear trouble, it is easily surmised why phone-massage alone should often prove disappointing. There is a necessity, in case of labyrinthal deafness, to consider its character or cause:

1st. When independent of middle ear trouble, the cause being central or local, from brain or nerve lesion due to systemic, toxic or other causes, as intra-labyrinthal hemorrhage or traumatism, which class of cases is rarely met with and

probably constitutes less than 5 per cent. of all cases in which the labyrinth is perceptibly involved.

2nd. When secondary to or associated with middle ear trouble:

A. Cases in which inflammation has not been a causative factor:

1st. Result of exhaustion.

2nd. Result of non-use (as with the deaf-dumb).

B. Cases in which middle ear inflammation has been a factor, causing:

1st. Inflammation by extension,

2nd. Compression.

It thus becomes apparent that no heterogeneous combination of sounds will give promise of benefiting the labyrinthal end of the deafness present. Cases coming under the first heading are not benefited by any form of massage treatment, and with those coming under the second heading a suitable form of phone-massage should be selected for each subdivision, though always in combination or alternation with pneumo-massage. From a theoretical standpoint it would seem that for boiler-makers' deafness, a repetition of musical airs would give most promise of benefit, and that to educate the dormant nerves of the deaf-dumb either the human voice through a speaking tube, or the phonograph would be the most practical. It is essential in all cases that the interest of the patient should be kept active by either the selection of recognized tunes or by the employment of speech. Phone-massage, if too long continued, or if the notes are too shrill or too powerful, will prove exhausting to the auditory nerve and may possibly cause labyrinthine hemorrhage. I have had no personal experience with mechanical devices for the production of uncombined phone-massage.

Of course with any mechanical device for the production of pneumo-massage there is unavoidably present a certain amount of noise, which becomes more pronounced as the speed of the motor increases, the effect of which is undoubtedly, at times, unfavorable, any may explain the lack of improvement sometimes observed when mechanical pneumo-massage has been employed. The practical absence of noise in the giving of massage treatment with the Siegle device is, to my mind, the principal advantage in its use. Should, in future, a method for eradicating noise from mechanical pneumo-massage be devised, it will be an undoubted advantage, though the regular and unvarying character of the noise as at present exists is the least disadvantageous, and in the most perfectly con-

structed pumps is reduced to a minimum. Such noise may, in fact, at times be an advantage. In this connection attention must be called to the pneumatic otoscope of Bishop[4] with which either gentle or powerful hand massage can be given, even better than with the device of Siegle, and additionally if desired in combination with a magnified view of the parts being treated.

In order to watch the effect upon the m. t. a pneumatic speculum can be used as the ear-piece, and such practice is particularly advisable during the first few treatments, or until the tolerance of the patient is learned. It is only the slow vibrations that can be seen and counted. Above 150 V they run into each other and lose their individuality. A faint reddening of the drum-head is an indication to discontinue. A treatment "should never cause pain, vertigo, echymosis, or increase tinnitus; if so it has been too vigorous."[12] Old cases, with tough and thickened drum-heads, will stand the greatest dosage, though tolerance in most cases will increase as the course of treatment progresses.

As regards the application of pneumatic massage in aural practice it may be said, in a general way, when addressed more particularly to the middle ear, that slow vibrations with but little noise are of the greatest value. When greater speed is employed its effect reaches more to the labyrinth, and this is furthermore favored by the increase of noise due to the more rapid motion of the engine. In order to secure the greatest range of therapeutic action it is essential to be able to command a stroke ranging from the merest tremor, say 1-16 inch, up to 1 inch or more, and as regards speed from 30 to 40 V per minute up to 600 V or more.

The conclusions to be drawn are that slow vibrations (30 to 90 V) are generally best adapted to middle ear troubles; that more rapid vibrations (300 V and over) have a more pronounced effect upon the labyrinthal nerves, and that improvement of middle ear conditions will have a favorable effect on the labyrinth in those cases in which trouble of both the middle and inner ear co-exist.

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Columbus Memorial Building.

ICHTHARGAN. ITS USE IN NOSE AND THROAT DISEASES.*

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Ichthargan was sent me by the Ichthyol Company of Hamburg, for the purpose of testing its value in nose and throat diseases. For the past year this compound of our two valued drugs, silver and ichthyol, has been used in the clinics where I work and its effects have been carefully watched by assistants. The observations compiled by me are the result of the work of my two assistants, Dr. J. W. McCready and Dr. Colin Begg, to whom I give full credit for their work with this remedy. The principal contributions to literature concerning this drug are by Dr. Aufrecht, consisting of reports of experiments on the lower animals; clinical work has also been done by Drs. Leistekow and H. Loenstein. So far as I am informed there is no rhinological literature on the subject.

Ichthargan is a compound of silver and ichthyol. Its chemical name is silver-thio-hydrocarbo-sulphonate and it is a brown, amorphous powder, odorless and stable. It is easily soluble in water, glycerin, and diluted alcohol;but in insoluble in absolute alcohol; ether and chloroform. The aqueous solution becomes gradually darker when exposed to light; but if kept in amber-colored bottles it undergoes no change. A concentrated solution is precipitated by a solution of sodium chloride, and also by a solution of albumen; but the latter precipitate is redissolved by an excess (of albumen). Ichthargan contains 30 per cent of silver and 15 per cent of sulphur, both in organic combination with the bases from the ichthyol sulphonic acid. It is thus seen that in its silver contents ichthargan is the strongest of all the silver compounds; argonin containing 4.2 per cent of silver; argentamin, 6.3 per cent; protargol, 8.3 per cent, and largin, 11.1 per cent.

It was to be expected a priori that this compound would prove a strong bactericide, but it still had to be ascertained whether it possessed the strong antiphlogistic, secretion-diminishing, and penetrating properties that are so eminently peculiar to ichthyol. A series of experiments were undertaken by Prof. Aufrecht (Deut. md. Woch. No. 13, 1900), with a view of throwing some light on

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the above points. To ascertain the penetrating properties of ichthargan pieces of rabbit liver were immersed in a 0.5 per cent ichthargan and the same of silver nitrate respectively. After sixteen hours they were removed and treated with ammonium sulphide. The pieces from the ichthargan solution contained a brownish black percipitate throughout their entire mass, while those from the silver nitrate had a black coloration of silver sulphide on their surface only. This shows the greater penetrating power of ichthargan over silver nitrate. Further experiments show that it had in 0.3-0.5 per cent solutions, it had the power to prevent decomposition in meat, bouillion, urine and other organic liquids. In numerous experiments with anthrax bacilli, gonococci, streptococci, staphylococci, typhoid and diphtheria bacilli, it was shown to have a much higher bactericidal power than silver nitrate. It was demonstrated as less toxic than the silver in experiments on frogs, guinea pigs, rabbits and dogs."

The toxic dose according to Dr. Aufrecht, is between .10-.15 centigrams for every kilo. of weight, while that of silver is .015, actol .035, irtol .02, protargol .04. This shows that the other silver salts are much more toxic. The investigator himself took .3 of ichthargan on three successive days and on the fourth day, .5 without unpleasant effects. He concludes that the drug when administered by mouth or subcutaneously, is not followed by dangerous results. In intravenous injection the ichthargan is more toxic, but is less so than the silver preparations.

Ichthargan for nose and throat work must be used in preparations from 1-50 to 1-10. The strength of 1-20 has been found best for general use. Water or glycerine or a mixture of both make a convenient vehicle for the drug in practice. In the clinic work both glycerine and watery solutions were used so that the exact effect of the drug in both solutions could be determined, one being substituted for the other as soon as a particular effect was noticed in order to determine whether any of the effect observed was due to the glycerine menstruum. This is necessary in many cases as glycerine is an active remedial agent. It may be mentioned here that it was found best to keep the bottles containing the drug in a dark place, to prevent precipitation along the sides of the bottles of what looked to be metallic silver. When the drug is applied as a powder it causes smarting, burning and sneezing and should never be used in this form. It is not strong enough to be a cauterant and yet is strong enough to produce considerable irritation.

Effects. Watery solutions of .1 to .3 per cent seem to have no other effect than to increase the flow of mucus from the nose. There was very little irritation and only a moderate amount of smarting for about a minute. The same percentage dissolved in glycerine showed only the effects of the glycerine. A 1 per cent solution was more irritating, but no vascular changes were observed in the nasal mucous membrane and the secretion was but little more than that produced by the lower per cents. An interesting point in this connection is that some patients complained of the use of these solutions, while others did not complain at all. In 10 per cent solutions the patients complained of disagreeable taste and nasal irritation lasting over 15 minutes, sometimes as long as two hours. This strength solution caused some congestion of the membrane a few minutes after its application, with profuse nasal discharge and lachrymation with some sneezing. After considerable experimenting it was found that the most generally satisfactory solution was 4 per cent. This produced generally a slight burning and smarting, never enough to amount to pain, even in acute coryza cases, where the nose was hypersensitive. There was no over-reaction from the 4 per cent solution. After application of the solution to a congested area there was noticed an anemia with some contraction and shrinkage of the mucous membrane. There seemed to be some slight anesthesia produced at the same time. We never noticed any interference with the nutrition of the tissues. The anemia produced was not particularly marked in all cases, while in others it was almost as pronounced as that produced by suprarenal. In still other cases there was no vascular change observed. Almost all drugs used in the nose produced either hyperemia or anemia of the membrane and this effect can not be claimed as one of the special effects of ichthargan. Occasionally simple irritation of the nasal mucous membrane will cause anemia of the part and probably the slight astringent action of this drug, together with the mechanical effect of its application causes the anemia noticed. The anesthesia noticed cannot be put to any practical use since it was so slight and was possibly only the loss of sensitiveness often found in anemic tissue. Its action, however, was very prompt, the effect being produced in 20 seconds and lasting from 15 to 20 minutes. This is especially true of the contracting power of the drug and its control over hyperemic nasal vessels. Not having used it in the normal nose, I can only speak of its use in pathological conditions.

It seems to be useful for the effect which has (1) an anesthetic, (2) antiseptic, (3) antiphlogistic, (4) stimulant, (5) alterant and (6) as a modifier of nasal secretion. The anesthetic effect is not marked, and is secondary to its effect on the blood vessels. Its antiseptic effects are not only seen in culture tubes, but in experiments in the nose in cases of atrophic rhinitis, the odor is materially lessened in a short time. As an antiphlogistic it has an important action on the respiratory mucous membrane. Its first effect is to produce anemia. This is followed, under strong solutions, by no reaction, the parts simply returning to their normal condition. When stronger solutions are used the irritant effect is more marked, producing congestion in from half an hour to an hour after application. This excessive congestion disappears in 15 minutes and the circulation in the nose seems to be improved afterwards. When ichthargan has been used for some time a tolerance is established. This is followed by improved blood vascular tone and clearing up of the congestion.

These effects have been observed not only in acute congestive conditions, but also in chronic congestion accompanying the active hyperemic stages of inflammation.

As a stimulant the drug acts in two ways. First as an alterant to produce more healthy circulation, diminishing congestion, lessening exudation and it also acts probably directly on the cell protoplasm itself. In modifying secretion it seems to act by lessening leucocytosis. Under its use muco-purulent secretions become mucoid and are soon normal.

Comparison with silver. The astringent and antiphlogistic effects of this drug are about the same as the silver salts. Compared with silver nitrate it may be said to be 1-10 as irritating, but in strong solutions or as a powder it never cauterizes. This must not be forgotten. The question as to whether the ichthyol effects can be observed is of slight interest. One can state that the alterant effects and the tendency to modify secretion is not as much due to the silver as to the ichthyol. However, if we acknowledge that the stimulant alterant and antiphylogistic effects represent the ichthyol, we still find the advantage with the ichthargan solution in that it is odorless. The preparation cannot be said to have an ichthyol taste, the petroleum flavor being modified by the metallic taste of the silver. It is clear that this remedy is not as useful as silver when cauterization is necessary, but it has the advantage in that it is non-irritant and non-cauterizant in fairly strong solutions.

If we add the good effects of ichthyol to the desirable effects of silver we have a preparation which can be used to great advantage in some cases. It will be found most useful in acute catarrhal rhinitis in a 4 per cent solution; in cases of hypertrophic rhinitis which are not particularly hyperplastic, and where obstruction results from disturbed circulation; here its antiphlogistic and alterant properties are valuable. In atrophic rhinitis cases if this remédy were used in weak solutions as an irrigation, 1 : 5,000, and afterwards in 4 to 10 per cent solutions in water or glycerin, it would seem par excellence, the remedy most indicated for atrophic membrane. In this disease we require some antiseptic, something to correct the circulation, a stimulant for the functional parts of the mucous membrane, and an alterative effect on the connective tissue. The leucocytic infiltration which is a prominent feature of atrophic cases is also benefited by ichthargan. It would seem to be clearly indicated in acute and chronic conditions of the naso-pharynx as well as inflammation of the pharyngeal bursa. It could not be used in the accessory sinuses except, perhaps, after operations, when it could be used in 10 per cent solution on cotton pledgets applied to the granulations which often appear. In tonsillitis and inflammations of the lingual tonsil, better results may be expected from the other silver salts. Ichthargan can safely be recommended in certain diseases of the larynx, in acute catarrhal laryngitis in adults in 4 to 8 per cent solutions sprayed over the parts, in laryngitis sicca in a 10 per cent glycerin solution, and in chronic atrophic tracheitis where there is abundance of dry saliva and scales.

In our experience ichthargan has acted well in acute rhinitis in a 2 per cent solution and in an ointment with vaseline. In hypertrophic cases the best results were from the use of a 4 per cent solution, the secretion in these cases being lessened, the purulent matter of the muco-purulent secretion disappearing leaving the secretion diminished in quantity and more mucoid in character. In cases of granulation tissue formation after operation a 4, 10 or 20 per cent glycerin solution has been of the greatest value in healing the exuberant granulations and modifying the secretion. Some of the most brilliant results have been obtained in these cases. In atrophic cases it seems to attain its most effective results. It acts like a charm since it combines the effects of the best two remedies. It may be said that in atrophic cases to arrest suppuration, remove scabs and stimulate the membrane to a healthy action, it is unequalled. We have treated at least fifty cases of this disease and

are in a position to state that the results with ichthargan have been more satisfactory than with any other form of treatment. The two following cases are taken at random to illustrate the effects of this drug.

Case I. Mrs. S. H., 24, for several years has been treated for atrophic rhinitis without deriving any marked benefit. The patient complains of dryness, itching, scabbing, constant desire to blow the nose, and bleeding if scabs are detached. On examination the nasal mucous membrane was dry and covered with scabs. There is atrophy of the turbinates on both sides, the region being covered with scabs and superficial ulcers. There are dry, hard scabs along the septum, leaving bleeding areas on removal. The nose was thoroughly cleaned and an application of a 4 per cent solution of ichthargan was used four times a week. The patient was given a 2 per cent ointment of ichthargan in vaseline to be introduced into the nose twice a day. The nose was not to be washed out at home. At the end of three weeks the distressing symptoms had disappeared, the scabs were gone and mucous membrane appeared healthy for an atrophic case. On examination two months later there were still no scabs, although the only treatment carried out had been the occasional application of the ointment at night.

Case II. Mrs. N.; 45, an old, neglected case of atrophic rhinitis. The patient complained of dryness, itching and disagreeable odor. Scabs were frequently discharged on blowing the nose. On examination the mucous membrane was found very dry and parchment-like with marked atrophy of the turbinates and atrophic naso-pharyngitis and pharyngitis. There were small ulcers under the scabs along the septum and hard, dry scabs with ulcers on other parts. The treatment consisted in thorough cleansing of the nose and naso-pharynx, with a solution of boric acid. The crusts were removed with a cotton applicator. The ulcerated spots were touched with a 10 per cent watery solution of ichthargan, and the entire nose and pharynx sprayed with a 4 per cent solution. This was done four times a week for five weeks, at the end of which time the mucous membrane was more vascular, and the ulcers and scabs had disappeared. One or two small scabs remained along the septum. After this treatment the patient only required the use of a 2 per cent ointment daily. The patient was seen one month later and showed decided improvement. There was no odor, no scabs nor ulcers, and the patient was discharged with instructions to use the ointment once daily.

We have also used this remedy in watery and glycerine solutions in various forms of nasal ulceration, in apthous disease, and syphilitic ulcers of the pharynx and mucous patches of the pharynx and mouth, in acute as well as syphilitic and tubercular laryngitis, and it has been as satisfactory as any silver preparation we have ever used. It would seem that this remedy were worthy of further trial in nose and throat diseases, and it is with confidence that we recommend it to all members of this Section.

SOCIETY PROCEEDINGS.

LARYNGOLOGICAL SOCIETY OF LONDON

Seventy-second Ordinary Meeting, March 7th, 1902.

E. CRESSWELL BABER, M. B., President, in the Chair.

The following cases and specimens were shown:

Case of Complete Recurrent Laryngeal Paralysis in a Male aged 24, which had Reappeared after a Period of Recovery.

Shown by Dr. Fitzgerald Powell. This patient was first seen on December 30, 1901, complaining that he had lost his voice quite suddenly on December 28. He could give no explanation as to the cause, unless it were strain from singing.

He further stated that in February or March of 1901 he had lost his voice quite suddenly in the same way. At this time he was not feeling very well, and three or four days after the voice became affected he had a severe cold, with rise of temperature, which was considered by his doctor to be due to influenza.

On this occasion he was under treatment by Dr. Bronner, of Bradford, and after three months his voice returned completely, and had kept quite strong until December 28 last, when he again lost it.

There was no history or evidence of syphilis, and nothing abnormal could be found in the chest. He complained of periodic headache and attacks of supra-orbital neuralgia. He had a spur on the right side of the septum nasi and a polypus causing nasal obstruction.

The most careful examination and investigation of his case failed to give the slightest explanation of the cause of what was found in the larynx, viz: complete paralysis of his left vocal cord, which hung in the cadaveric position, the inner edge of the cord being curved with the concavity towards the median line.

So far as could be observed there was an entire absence of the usual causes which produce this paralysis.

As regards treatment, the spur on the septum had been removed and the polypus snared, and he was placed on iodide of potassium

up to twenty grains three times a day, and strychnine had been administred.

On February 19 the paralysis was still complete, but on March 5 there was some movement in the cord, and the patient stated that on February 22 his voice had suddenly improved and was now much better, though still hoarse and weak.

The same treatment is being continued.

Sir Felix Semon suggested that the most likely explanation of the occurrence of the paralysis in such a case was peripheral neuritis. The history in this case of influenza would be quite sufficient to account for the occurrence of the first paralytic stroke. The nerve being afterwards left in a weakened state, recurrence of the paralysis on slight provocation was no unlikely sequel; some extra vocal effort on the part of a patient or a cold would be sufficient to produce such a recurrence. It was now becoming a general opinion that peripheral neuritis was a rather frequent cause of laryngeal paralysis. He had lately read a very interesting monograph by Cahn, of Strassburg, endeavoring to establish that the most frequent cause of laryngeal paralyses in tabes was peripheral neuritis. At any rate it was a subject well worth any one's while to follow up.

Case of Hæmatoma of the Vocal Cord in a Female aged 29.

Shown by Dr. Fitzgerald Powell. The patient was first seen on March 4, complaining of hoarseness and loss of voice, which came on suddenly in February of this year. On examination of the larynx the left vocal cord was seen to move very sluggishly on phonation, and an extravasation of blood was seen in its whole length, forming what he might describe as a "hematoma of the cord." The nose, pharynx, and larynx were the seat of chronic inflammation. The patient had lost her voice three years ago, but it returned after six months' treatment.

Dr. F. de Havilland Hall asked if the attack of hemorrhage coincided with the menstrual period, or whether there was any catamenial disturbance, because most of these cases occurred in women, and either coincided with or preceded the catamenia, or else some menstrual disturbance.

Dr. Dundas Grant said it would probably be within the memory of some of the original members of the Society that he had showed a case identical with Dr. Powell's case at one of the earliest meetings, in which the hematoma recurred on several occasions. To the best of his recollection it was associated with menstruation, but he had not had an opportunity of looking up the notes, and would not

therefore speak with certainty on this point. The case was reported in the "Proceedings" of the Society.* Ultimately a small angioma near the junction of the anterior and middle third developed on the upper surface of the left vocal cord. The patient had gone to South Africa and he did not know what had happened since.

Dr. J. Donelan thought the case was the result of influenza, from which the patient was still suffering; she had the characteristic eye. He had had two cases under his care—both the patients were men—in whom the hematoma had followed influenza and severe coughing. Some of the subglottic veins were enlarged, and from these tracheal hemorrhage had also taken place.

Dr. Fitzgerald Powell regretted to say that though he had promised to inquire with regard to the menstrual periods he had forgotten to do so, but he would ask the patient the next time he saw her. So far as influenza was concerned, he supposed the last speaker hardly wished to infer that influenza was the cause of the extravasation of blood otherwise than by causing trauma from coughing.

A Modification of Mackenzie's Laryngeal Forceps for Removal of Growths in the Anterior Commissure and Drills for Draining Maxillary Antrum through Tooth Socket.

Shown by Dr. Fitzgerald Powell. The forceps were simply Mackenzie's laryngeal forceps with the cutting ends turned forwards. He found that they were useful in removing growths from the anterior commissure, and he thought others might find them useful in cases where there was a difficulty in removing these growths with the straight forceps. At the same time he did not claim any "property rights" in the instrument, which was Mackenzie's with the slight alteration mentioned. The chief point of interest in the drills was their size, the largest being the size of a No. 14 silver catheter; these drills, he thought, provided a means of curing the great majority of cases of empyema of the antrum. They made a large opening through the tooth socket, after extraction of the first molar or second biscuspid, through which a tube could be introduced, and through which the antrum could be freely curetted and washed out. He thought there were only a few cases in which what is known as radical operation was required.

*See Vol. I, p. 2.

The President thought that unless more than one tooth was extracted the drill and tube were rather large to get in without damaging the teeth at the sides of the socket.

Dr. St. Clair Thomson presumed that the exhibitor, in claiming that the majority of cases of empyema of the antrum might be radically cured by drainage through the tooth socket, included only those cases in which none of the other cavities were affected. At one time he himself was inclined to enlarge the alveolar opening, but he came to the conclusion that it was not the size of the opening that was of importance in effecting a cure, because when one had had considerable experience in opening antra, one found that there were many cases in which a large drainage through the alveolar border would never overcome the difficulties. He referred to those cases with dissepiments from the floor, or with the mucous membrane in so altered a condition that suppuration was liable to be started again by the first fresh infection. Perhaps Dr. Powell did not mean that the cases were permanently cured.

Dr. Dundas Grant, in referring to the alveolar perforation, said he generally made use of a hollow trephine, the advantage of which was that it cut out the piece of bone which one removed instead of sending it or the bone-dust into the antrum. On one occasion, however, when he fancied he must have used almost excessive speed with it, there was actually a sequestrum of a little piece of bone around the trephining hole. Others had observed this fault as well, but he did not know the cause of its appearance. He thought it might he due to the intense heat generated; he did not use an electric motor, but a foot-drill.

With regard to the forceps, he thought the variation a most excellent one. If criticism a priori were permissible, he would say that the vertical shanks were rather too long; the upper angle would impinge upon the hard palate in a good many cases. Otherwise the instrument was an admirable one.

Dr. Herbert Tilley said that an almost precisely similar forceps had been in use for the last two years at the Throat Hospital, Golden Square, and was introduced there by Dr. Lack.

Dr. Lambert Lack said the forceps very greatly resembled some he had had made, and which had been in use at the Throat Hospital for over three years. In addition to the curve at the tip his forceps had an obtuse angle, which he thought a great additional advantage, as it held the epiglottis out of the way.

Dr. Fitzgerald Powell, in reply to the President's remarks on the

drill, said that it would be clearly seen in the example which he showed them, where the hole was made by the largest instrument, which was larger than that of a No. 14 silver catheter, that the teeth were not impinged upon in any way. Cases were occasionally met with in which the teeth were so close together that there was some difficulty in this respect, but in the vast majority of cases one obtained a good large opening in the way he advocated, through which drainage could be thoroughly effected, and through which the antrum could be curetted.

In reply to Dr. St. Clair Thomson, he said that if the ethmoidal sinuses were affected, it would be necessary to curette the sinuses at the same time that the antrum was being opened. One came across cases occasionally in which it was necessary to open the anterior wall and curette the sinuses very freely, but in all ordinary cases—which constituted the great majority—the measures he recommended were sufficient to effect a cure. With regard to Dr. Tilley, he only wished to emphasize that the forceps he showed were Mackenzie's laryngeal forceps, modified by having the cutting point turned forward, and they were absolutely and totally different from Dr. Lake's forceps, which were short and very light, with an obtuse angle instead of the right angle of Mackenzie's, and were practically only suitable for children.

In using Mackenzie's forceps he had found some difficulty in removing growths in the anterior commissure, and it occurred to him if the points could be turned forward the growths could be more easily reached. Hence the forceps he now showed.

Case of Paralysis of the Left Vocal Cord.

Shown by Dr. Willcocks. The patient, a postman aet. 45, had complained of cough and huskiness of the voice since last Christmas. On examination the left vocal cord was found to be completely paralyzed, both cords were white, and there was no local swelling in the larynx. There was no history of syphilis, and no signs of any source of intra-thoracic pressure, such as aneurysm or tumor.

Dr. de Havilland Hall said that though they must remember the possibility of peripheral neuritis in this case, yet there was less evidence of it than there had been in the case of Dr. Powell's patient. At the age of forty paralysis of the left vocal cord indicated very possibly the existence of an aneurysm. He called to mind a case of Dr. Fincham's at the Westminster Hospital, where the only sign of an aneurysm for many months—in fact, nearly a year—was

the cadaveric position of the cord. Eventually the patient developed well-marked physical signs of aneurysm, from which he died. In this case there might be no physical signs of aneurysm for many months to come, but they must still bear in mind the possibility of its being aneurysmal.

Mr. P. de Santi had shown a similar case to the Society only two meetings ago, in which, if he remembered correctly, Sir Felix Semon had considered there was an aneurysm in spite of the absence of the physical signs. The patient, a woman, was skiagraphed, and a well-marked dilatation of the arch of the aorta was easily made out; since then he believed the patient had been under the care of Dr. de Havilland Hall.

Sir Felix Semon had seen comparatively often the production of laryngeal paralysis in cases in which the aneurysm was so small that there were practically no physical signs to be obtained. The absence of physical signs of aneurysm in the chest was certainly no proof of its non-existence. He recollected a case which would serve as a very apt illustration. Many years ago the head-master at one of the big public schools consulted him on account of frequent fatigue of the voice. On examination of the throat he found paralysis of the left abductor. He then examined the chest, and thought there was possibly a very little dullness over the lower part of the sternum. Barring this dullness, there were no physical signs whatever; still, he suspected the presence of aneurysm. The patient was induced to see Dr. Ord, of St. Thomas' Hospital, who found the same condition and agreed entirely with the speaker as to the probable existence of aneurysm. The patient was at the time just about to start for a tour in Switzerland, where he intended spending the holidays. Both Dr. Ord and he advised him to go home and rest, and undergo a course of Tufnell's treatment. Dr. Ord knew the family medical attendant, and wrote to him expressing their joint opinion as to the case, in reply to which he received a letter saying that the writer wished devoutly there were no consultants in London, for they needlessly frightened patients, and that he had strongly advised the patient to proceed with his arranged plans and go to Switzerland. This was done, and the patient died four weeks afterwards from hemorrhage, caused by the bursting of a small aneurysm, which had, indeed, been present. The moral was obvious.

Dr. Donelan said, in reference to the remarks just made by Sir Felix Semon, he had shown to the Society in June, 1901, a sketch

of an aneurysm of the aorta in which paralysis of the left vocal cord was the only physical sign during life. The patient was an Italian man aet. 39, whom he had been asked to examine. He considered that the paralysis was probably due to aneurysm. On the morning of the day following this examination the patient was suddenly seized with what seemed to be angina pectoris, became rapidly collapsed, and died within two hours of the seizure. The post-mortem showed a small oval aneurysm on the posterior-superior aspect of the aorta, immediately outside the origin of the left subclavian, compressing the recurrent nerve.

Case of Laryngeal Stenosis due to Cicatricial Contraction in Interarytænoid Region.

Shown by Mr. H. Betham Robinson. The patient, a young man aet. 20, was brought to him on account of the difficulty in breathing on exertion.

According to the history he had had a severe attack of what was stated to be diphtheria some years ago; after it he had had no voice, but this had come back very slowly. Eight months ago the voice was only a squeak, but recently there had been great improvement, so that now there was only huskiness.

Examination showed a very large perforation of the nasal septum, involving both bone and cartilage, and loss of the uvula. In the larynx there was slight catarrhal reddening of the vocal cords, but the marked feature was the loss of abduction of the cords on deep inspiration with some stridor. On phonation the cords came together to the mid-line, except between the arytenoids. This laryngeal condition was due to a cicatricial web passing between the arytenoids, evidently the result of previous inflammation. Although no history could be obtained, syphilis explained the three lesions mentioned.

The President said the question was whether the cause of the condition was syphilis or diphtheria; the nasal trouble might, he thought, be caused by the latter, and possibly the laryngeal trouble also. He suggested that the man ought to have tracheotomy performed as soon as possible.

Sir Felix Semon drew attention to the adhesion between the posterior ends of the vocal cords in the very small part just visible above the interarytenoid fold. Supposing the cicatrix had been a little bit lower, everybody would have looked on it as a case of bilateral paralysis of the glottis openers. This case reminded him

of the well-known case of Sidlo's, of Vienna, in which a similar diagnosis was made, and after death a cicatrix was found on the posterior wall of the larynx. The case to which he referred was extremely interesting as showing how careful one had to be, if the cords were lying close together, not to rush to the conclusion that the condition must needs be of nerve origin, and to remember the possibility of a mechanical origin. As to the particular case under discussion, he thought the perforation in the nasal septum and the absence of the uvula would make him very skeptical in regard to the diphtheritic origin of the case; there was, on the contrary, strong evidence in favor of syphilitic mischief.

Dr. Dundas Grant thought it was very likely a case of perichondritis, such as occurred in typhoid fever; there was decubital ulceration from the pressure of the cartilages against each other. If the man were left in statu quo he was in considerable danger, but he did not consider that the operation for the relief of these cases was very satisfactory.

Dr. St. Clair Thomson said that in the absence of reliable history the evidence in favour of syphilis was not more than a suspicion. If the perforation in the nose occurred when the man was not having any treatment, it was very usual to find retraction afterwards causing some falling in of the nose, and even retraction round about the perforation, just in the same way as was found with the soft palate and uvula in inherited syphilis. It might be a coincidence that the syphilitic process in the larynx took place exactly in the middle line, but he thought it more likely to be of diphtheritic origin. He agreed with the President in thinking that tracheotomy was urgently called for.

Mr. Robinson, in reply, thought all the lesions were due to syphilis, and could not agree with the diphtheria explanation put forward. Of course, if they wanted to explain the condition by two causes, diphtheria and sphyilis would do, but such was unnecessary when one common cause was sufficient. With regard to the question of operation, the lad was a pupil-teacher, and the whole matter had been put clearly before him and his parents, explaining the risks he ran. They were, however, unwilling, bearing in mind that he was dependent on his voice for his living, to have anything whatever done, and there the case must rest.

Sections of Tuberculous Growth of Mucous Membrane of Right Middle Turbinal in a Man aged 50.

Shown by Dr. Adolph Bronner. The patient from whom this growth was removed was first seen on June 20, 1901. He had had nasal obstruction off and on for some years, with discharge into throat; he could never smell well, but taste was fairly good. He gave a history of an ulcerated throat one year previously. The nose had been worse for some weeks, with pain over the bridge. He had noticed a rather offensive smell from the right nostril for two or three weeks.

The apex of one lung was affected. Both nostrils were blocked by swollen mucous membrane of lower turbinals. This was removed by a snare and galvano-cautery.

On July 25 the right middle turbinal was much enlarged, and on it a large patch of ulcerated mucous membrane. A piece was removed by snare for examination. Trichloracetic acid was applied and aristol insufflations were ordered.

On September 24 there had been very little discharge or bad smell or pain for three to four weeks, and the nares were patent. The right middle turbinal was still enlarged, but the ulceration had healed.

The Clinical Research Association reported: "This growth consists of tuberculous granulation tissue in which are many miliary tubercles with large giant-cell systems."

Dr. St. Clair Thomson suggested that Dr. Bronner be invited to give a specimen to the museum, because, as far as his recollection went, it was extremely rare to see a specimen of tuberculosis of the middle turbinal. The best article he knew on primary tubercle in the nose was that written by Mr. Steward in the "Guy's Hospital Reports," Vol. LIV, where it was pointed out that primary tubercle in the nose generally attacked the septum, and that next in frequency came the inferior turbinal, but that the middle turbinal was very rarely subject to tuberculosis.

Case of Tertiary Intra-Nasal Syphilis in which the Right Frontal Sinus had been opened twice with Negative Results, in a Married Woman, aged 48.

Shown by Mr. P. de Santi. The patient was first seen five weeks ago, complaining of great pain at the back of the nose and head, also of a foul discharge from the nostrils and occasional discharge of pieces of bone.

She had been married seventeen years, and had had three miscarriages and one seven months' child born dead.

Nine years ago she first noticed a discharge of small hard lumps of a greenish color from the left nostril, also occasional swelling at the root of the nose; soon afterwards a similar discharge occurred from the right nostril, and the discharge, which had included frequently pieces of bone, had continued ever since, and had got worse and worse. Three and a half years ago she had had paralysis of left facial nerve, which came on suddenly, and cleared up entirely after about eighteen months' time.

In 1901 the patient was an in-patient at University College under Mr. R. Johnson for nasal discharge and headache. There was pain over bridge of nose and right frontal sinus, slight diminution to tactile sensation over left side of body, and slight apparent weakness of facial muscles on the left side. The right frontal sinus and maxillary antrum were explored, and found to be healthy.

The patient left the hospital unrelieved, and on September 25, 1901, was admitted into Charing Cross Hospital, under Mr. Waterhouse, and the right frontal sinus was opened, a little purulent material exuding; the mucous membrane was in a thickened and catarrhal condition. An attempt to pass a small rubber tube down the infundibulum was unsuccessful, and a strip of gauze was substituted. The frontal sinus was packed with iodoform gauze, and the usual dressing applied. After the third day a No. 2 catheter was passed down infundibulum, and this was done daily, the parts being washed out with boracic solution. The fetor became less, and after a few days' treatment the patient passed a large mass of necrosed bone, which consisted of a part of the lateral mass and ethmoidal cells. The frontal wound was granually allowed to heal. Patient was discharged on October 10, 1901, unrelieved. She now complained of intense headache, loss of sleep, diarrhea, and a half-choking sensation. The pains in the head appeared to be referred to the back of the nose and frontal regions.

Examination of the nose showed large greenish-black sloughs in the posterior region of the intra-nasal cavity; there had been extensive destruction of the bony lateral masses, but the septum was intact.

The patient's condition, in Mr. de Santi's opinion, was due to syphilis, and she had had large doses of iodide of potassium, but without benefit. Suggestions as to operative treatment were invited.

Dr. Dundas Grant said the woman seemed to be in a very serious condition. He strongly suspected tertiary changes were taking place in the sphenoid, and probably there was a sequestrum at the junction of the sphenoid and the vomer; he thought Mr. de Santi might explore this region with his finger. He had had a similar case to this under treatment, which consisted in taking the patient into hospital and giving her the good feeding up which her circumstances at home rendered impossible. He was giving her inunctions of mercury with iodide of potassium and opium internally. He recommended the same treatment to Mr. de Santi's patient.

Dr. Herbert Tilley agreed with Dr. Grant as to the possibility of deep-seated bone mischief in the sphenoidal region, and cited a similar case which died of basal meningitis after temporray improvement by mercurial inunctions and constant nasal douches. The pus between the middle turbinal and the septum, the pain on the top and at the back of the head, together with deep-seated pain in the right eye and frequent disturbances of vision, were all symptoms very suggestive of suppuration in the sphenoidal sinus.

Mr. de Santi, in reply, said the first point to be mentioned was in regard to the diagnosis which was raised by Dr. Grant. There could be no doubt that the woman was suffering from tertiary syphilis of the nose, and that the disease had penetrated as far back as the region of the sphenoid bone. Nor was there any doubt that her condition was a somewhat serious one, and that she must undergo some further operation. She should, he thought, be examined thoroughly under an anesthetic, and the posterior nares be carefully explored with the finger, and, of course, what might be done afterwards depended on what might be found. If the sphenoid bone were necrosed and firmly fixed, it would not be safe or wise to try and get the necrosed bone away, unless it would come away with the exercise of very little force. If a sequestrum had formed, as he feared, its removal might be quite easy, or, on the other hand, difficult and dangerous.

When the patient first went to University College Hospital, and was under the care of Mr. Johnson, she had very intense headache, and there was considerable pain over the bridge of the nose and the right frontal sinus. The patient localized most of the pain in the head on the right side of the frontal bone, and the area of tenderness to pressure was over the right frontal sinus, and he supposed these were the reasons why the right frontal sinus was opened. Moreover there was a nasal discharge consisting of thick

greenish pus, and this was seen mostly in the middle meatus. He could not go further than that as to the reasons which probably prompted Mr. Johnson to operate on the right frontal sinus. Later the patient was at Charing Cross Hospital, complaining of similar symptoms, only they were aggravated. It was only fair to Mr. Waterhouse to say with regard to the second operation on the frontal sinus, that although the woman now denied it, it was against his advice that the operation was undertaken. The patient insisted on Mr. Waterhouse doing it, and it was done under protest. One of his colleagues at Charing Cross, Mr. Bloxam, felt certain there was nothing the matter with the right frontal sinus before it was operated on again by Mr. Waterhouse, but was of opinion that there was a mass of dead bone at the back of the nose.

He could not go further into the subject of the indications for and advantages of the frontal sinus operation, but as regards this particular case, the reasons for operation was the pain referred to the right frontal sinus, which was constant and excessive before the sinus was opened.

A Case of Angioneurotic Œdema of Right Hand With Recently Developed Attacks of Difficulty in Breathing.

Shown by Mr. P. de Santi. The patient, a married woman aet. 26, was in the London Hospital four years ago with swelling of the right hand and forearm, and angioneurotic oedema was diagnosed. The treatment consisted in elevation of the limb.

Since then she had had several further attacks, always of the right hand. The attacks began with a feeling of tightness in the hand, rapidly followed by great swelling of the fingers, hand, and forearm, the fingers becoming almost black in color, and the rest of the affected parts bluish red. The attacks lasted a variable time, and then the parts returned to the normal. There was no particular periodicity in the attacks, and no family history of similar conditions. About six weeks ago the right side of the face became swollen, and for three weeks the patient was unable to open the mouth properly, having to live on slops. Then followed suffocative feelings in the throat, which occurred both by day and night, the patient feeling as if the throat were being tightly gripped. The attacks were slightly relieved by adopting the sitting posture. The hand had not been affected for four months.

Examination of the larynx revealed no oedema or abnormal condition. The cause was brought forward as, in these cases of angio-

neurotic oedema, of which Mr. de Santi had seen two, sudden oedema of the larynx proving fatal might occur.

Osler had knowledge of one family extending to five generations in which twenty-two various members had been attacked by angioneurotic edema, and in which two had died of edema of the larynx. This disease was characterized by the sudden onset of local edematous swellings, more or less limited in extent and of transient duration. The parts attacked were usually the face, back of the hands, the buccal or pharyngeal mucous membrane, or the larynx. Mr. de Santi would be glad if any members could inform him if they had had any experience of throat trouble in these cases of angioneurotic edema—otherwise called Quincke's disease.

Dr. de Havilland Hall thought this an extremely interesting case. He had a case under his care which he saw from time to time, the patient being a lady of forty-four or forty-five years of age, who was subject to attacks of angioneurotic edema of the neck and buccal mucous membrane, and as she had had on one or two occasions great difficulty in breathing he inferred that the symptoms extended to the larynx. Unfortunately he had never been able to see the larynx affected; but usually he saw the buccal mucous membrane in an edematous condition. This patient was undoubtedly a gouty subject, and she had derived most benefit from a course of treatment directed to the gout, and from alkalies. She was formerly a patient of his late colleague, Mr. Bond, who had been treating her with bicarbonate of potash and bark with considerable benefit, and occasionaly doses of blue pill. He had not seen the patient now for three or four months, but he had heard that the attacks were getting less frequent. He sent her to Llandrindod Wells for a course of treatment, and she had come back very much better. He had seen another case in a boy who had no throat complication, but who was subject to attacks of angioneurotic edema, which were located in the back of the left hand and wrist. It was an interesting case, as the patient had developed cyclic albuminuria. When in the recumbent position there was no albumen in the urine, but on getting up and about a trace was found. He thought this combination of the two conditions—angioneurotic edema and cyclic albuminuria—in the same patient a matter of some interest.

Dr. Edward Law thought that some of the members might remember that five or six or seven years ago he had brought before the Society a case of well-marked Quincke's disease.

Case of Rapidly Recurring Papilloma of the Larynx.

Shown by Dr. Lambert Lack. The patient, a Swiss waiter aet. 21, had suffered from hoarseness for four months. When first seen six weeks ago there was what appeared to be an ordinary fairly large papilloma on the anterior part of the right vocal cord.

This was at once removed under cocaine. Subsequently there was considerable congestion of the vocal cords, which increased during the following three weeks, until both cords appeared red, thickened, and irregular, resembling the "fleshy granulating" cords often seen in tubercular disease. The patient was "run down," and had considerable cough and expectoration. He was now much better, and the local condition had cleared up, but on examining the larynx it would be seen that the growth had recurred, and there were at least two distinct fresh growths on the other cord.

Mr. Lake said he could not help thinking that in this case if Dr. Lack removed the growth, the careful bacteriological examination of a portion of such a rapidly growing papilloma might throw some light on its causation; micro-organisms that were found might serve as an important aid.

The President, from a cursory examination, thought the case was suitable for the application of the galvano-cautery.

Case of Traumatic Tracheal Obstruction.

Shown by Dr. Dundas Grant. Edith C—, aet. 22, was first seen on February 13, 1902, complaining of difficulty and loudness in breathing, especially when hurrying. These symptoms had existed since an accident at three years of age, when she fell on the blade of a knife and punctured her windpipe. She had no difficulty in breathing at night, but the dyspnea had been getting worse during the last six months. It was worse after food. There was no indistinctness in her speech, but a slight apparent effort. The left vocal cord was completely fixed, and without doubt the left recurrent laryngeal nerve must have been injured. The extremely late period at which the narrowing had more strongly asserted itself was difficult to explain; it was hardly likely that there was anything in the way of a polypoid granulation, but more probably cicatricial contraction. Dr. Grant had advised that she should come into the hospital for a more thorough examination, and if possible for the introduction of a tube into the trachea for direct inspection.

Case of Rhinorrhœa in a Girl aged 9.

Shown by Dr. Cathcart. Since the patient was two years old she had had a thin watery discharge from both nostrils, which caused excoriation of the upper lip. During the last six years she had twice been operated on for adenoid growths, and on four other occasions the nose had been examined under an anesthetic and either curetted or cauterized with nitrate of silver or the electro-cautery.

Everything in the way of drugs had been tried, both internally and locally, but the discharge still continued.

Dr. de Havilland Hall had had a case at Westminster Hospital, and on measuring the fluid he found it amounted in the twenty-four hours to nearly a pint. The fluid was clear and limpid, and came undoubtedly from both nostrils, and not from any other part. At that time he had thought the case due to a vaso-motor condition. His patient had derived most benefit from mustard footbaths with morphia and atropine. He had originally been under his care sixteen or seventeen years ago, and he had seen him quite recently—during last week,—and he had now nasal polypi. When he felt the attacks coming on he put his feet into the mustard foot-bath and took a dose of 1 minim atropine and 5 of solution of hydrochloride of morphia. In Dr. Cathcart's case he would feel inclined to try a weak spray of adrenalin solution.

Dr. St. Clair Thomson said it was very rare to find this condition of uncomplicated nasal hydrorrhea in a patient so young as nine years. The cases which had come under his observation had been much older. As to their treatment, speaking from personal experience, he thought it extremely unsatisfactory. By giving placebo treatment many cases would undergo a temporary spontaneous cure, but the symptoms were quite likely to come on again at any time. Yet a certain number of cases seemed to be relieved by the use of atropine, particularly if it was combined with Liq. Strychinae, as suggested by Lermoyez, whose contention was that the atropine checked the glandular secretion, and that the strychnine was beneficial to the vaso-motor paresis. He had given a pill containing extract of belladonna, quinine, and extract of nux vomica. The results were uncertain from the use of adrenalin, for cases were published in which the adrenalin, instead of being beneficial, made the patients very much worse. He had heard of a city man who particularly wanted to attend a public meeting, and

had adrenalin administered to him in order to tide him over the meeting, with the result that he was so much worse that he was unable to go at all, whereas without the adrenalin he could have got through with two or three handkerchiefs. He would like to hear from other members what results, even if negative, had followed the use of adrenalin in their hands. In more than one case in which he had explained the condition of affairs, and refrained from local treatment, the patients had gone elsewhere, and had a great deal of the galvano-cautery, but with what results he did not know. General treatment and that of hydrotherapy at different health resorts had at the least an elevating effect.

The President said he could not suggest the same treatment he had recommended for Mr. Lawrence's patient at the last meeting—the application of the continuous current externally to the nose. He wished to add that adrenalin required to be used carefully; if it was applied too strong it might produce prolonged sneezing. He employed a solution of 1 in 10,000 of adrenalin chloride to contract the nasal mucous membrane.

Sir Felix Semon said he had lately frequently used adrenalin in view of the many recommendations bestowed upon that remedy, and he found that for about an hour or two after its administration it produced a stoppage of secretion and feeling of absolute dryness in the nose, followed by infinitely greater discharge than previous to its use.

Mr. Waggett considered that it was worth while to make trial of the treatment of Lermoyez in its entirety, for he had had three or four lady patients under his care who had taken the trouble to pursue the treatment regularly, and had obtained complete relief of hydrorrhea. Whether or no this was to be permanent he was unable to say. The syrup used contained strychnine and atropine (vide "Journal of Laryngology," Vol. XV, p. 442.)

Dr. Law, replying for Dr. Cathcart, said that adrenalin had been tried, but without success, also many other remedies.

Dr. Bronner asked if any member had tried the desiccated suprarenal extract, which was in the form of a powder, and was used as a snuff. He thought it acted better than the solution of adrenalin. It was used 1 to 10 with boric acid and a little menthol.

Case of Atrophic Rhinitis in which Melted Paraffin had been injected into the Inferior Turbinate Bodies with Good Results.

Shown by Mr. R. Lake. The patient, a woman, aet. 25, had been afflicted with fetid atrophic rhinitis for many years. Crust for-

mation had been got under the usual treatment, but the patient was dissatisfied, as she felt no air passing down the nose. This suggested to him the idea of contracting the passages by making an artificial inferior turbinate by means of submucous injections of paraffin.

The injections were made under the posterior surface of the inferior turbinate, about m v each time with intervals of one week. The total increase of length obtained was not great, but the relief was most satisfactory to the patient.

The needle required was one of fair calibre, three inches in length, and attached to the syringe by means of a screw. The syringe employed was one with metal bands connecting the metal ends and worked with a screw piston to overcome the friction caused by the long needle.

The President asked Mr. Lake if the patient had benefited as far as the symptoms were concerned. Dr. Dundas Grant said that the turbinated bodies looked an excellent size at present. He asked whether a local anesthetic was required, and whether cocaine was contra-indicated, owing to the fact that the contraction it would produce would militate against the successful injections.

Mr. Waggett thought the most remarkable point about the case was the color of the inferior turbinals, which was now practically of a normal tint. He had closely questioned the patient, and from her replies he had gathered she must have enormously improved. He heartily congratulated Mr. Lake on his very ingenious new method of treatment.

Dr. Lambert Lack said that although the patient herself was positive that she had derived great benefit, the treatment seemed to him utterly irrational and against the modern ideas of the pathology of the disease. He thought much more evidence was required before this treatment could be accepted.

Mr. Lake, in reply, said he had used cocaine, and that it answered very well. With regard to the symptoms, the girl bothered him after the crust formation ceased, because she would not blow her nose; she had plenty of room, but she could not feel air pass down the nose. He was pleased to hear Dr. Lack's strictures, because it was a question of some considerable interest as to what was the pathology of the disease. People talked of the destruction of the turbinals as if this were part of the disease, but why did they disappear?

In the present case the patient expressed herself as more com-

fortable with the substituted inferior turbinals, which merely relieved the symptoms. He did not feel so confident in the present pathology of atrophic rhinitis as described in the text-books to quite accept the explanations given by them as correct.

Papillomatous Growth on the Posterior Edge of the Vomer.

Shown by Dr. Herbert Tilley. The patient, an adult, male, had been under treatment for almost complete nasal obstruction in the left nostril. In the course of examination a small whitish growth the size of a yellow pea was seen by posterior rhinoscopy situated on the posterior edge of the vomer about the middle of its length. The growth was dead white in color, contrasting very markedly with the normal redness of surrounding structures.

The growth had not been touched by finger or instrument, and hence the exhibitor could say nothing of its feel or consistence. He had once seen a definite papilloma growing from that spindle-shaped mass of mucous membrane so often seen on the posterior edge of the vomer, but had never met with a condition similar to that in the case exhibited. He regarded it as a harmless curiosity.

The President said in regard to this case of growth on the edge of the vomer, he would not like to say without feeling it with his finger whether it was papillomatous or cartilaginous in character. He thought the growth different from the ordinary swellings seen near the posterior margin of the vomer.

Sir Felix Semon said that in that part of the vomer one often saw little symmetrical thickenings. This growth might simply represent an excess of the ordinary thickening.

Case of Syphilitic (?) Disease of Larynx simulating Malignant Disease.

Shown by Dr. Herbert Tilley. The patient was a well-proportioned man aet. 28. For six weeks he had complained of "hoarseness," and for the past week of pain on swallowing, which shot from the throat towards the right ear.

The irritation in the throat caused a cough, but at no time had he expectorated blood. The patient had syphilis about five years ago.

The larynx was uniformly congested, but the right vocal cord was motionless on phonation, and there was considerable, but uniform, swelling of its posterior half. Below the level of the cord for about half an inch in a vertical direction, well-marked ulceration was seen; there were no prominent edges or projections from

the surface of the ulcer. The right arytenoid cartilage moved on phonation. A hurried examination of the chest had been made, but so far as it went no evidences of tubercular mischief were obtained. The appearances in the larynx simulated malignant disease, but at present the patient was being treated on the hypothesis that the lesion was a syphilitic one.

Dr. Fitzgerald Powell did not quite catch whether or not the chest had been examined. It seemed to him, from the appearance of the condition, it was much more likely to be tuberculosis than either syphilis or malignant disease. The larynx was pale in color, there was present to a fairly large extent cough and expectoration, according to the mans own account. He seemed to have been having night sweats, and showed other symptoms of tubercle; under these circumstances he thought that until the sputum had been examined, and they knew the condition of the chest, it was almost impossible to come to a definite conclusion with any certainty as to the condition, but he believed it to be tubercle.

Suppression of Consumption.—R. C. BANKSTON, M. D. (Birmingham, Ala.)—*Atlanta Journal-Record of Medicine,* Jan., 1902.

After reviewing the established and probable factors in the distribution of tuberculosis, the authors contend for a committee of five physicians, to be known as the Committee or College of Science, to meet at various places and study the disease and conditions productive, and recommend governmental plans for its suppression, this committee to be supported by the state, and each state commission reporting to a supreme one established by the United States government. The standing and ensemble of the latter to be on a par with the Supreme Court. There should be two sittings annually, and the members should devote their whole time to their duties. The members should hold office for ten years and the terms should be so arranged that one member should go out every second year.

There should be a Department of Public Health and a chief officer over all.

F. C. E.

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It is our purpose to furnish in this Department a complete and reliable record of the world's current literature of Rhinology, Laryngology and Otology.

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SELECTED ABSTRACTS.

Case of Nasal Sarcoma, with Remarks.—DUNBAR ROY, M.D. (Atlanta, Ga.).—*Record of Medicine*, Jan., 1902.

The case is reported for two reasons: Because of the probable transformation of a benign into a malignant growth by traumatic irritation, and the surgical method resorted to in the treatment. The author quotes Nasse, who declares that trauma is more frequently the cause of sarcoma than any other tumor. Wurdemann and others have reported cases in which the brunen seemed to be transformed into the malignant, through instrumental manipulation, and the author is of the belief that the following was such a case:

Miss B. came to him in June. Was well up to February previous, when she consulted her family physician, who diagnosed polyp, and removed it with scissors. Growth returned shortly and was again removed. Very soon the nasal cavity being again filled, she went to a neighboring city to consult a surgeon. He declared it a surface polyp, and removed and curetted it several times during a month, even tearing it away. Operations were attended with excessive hemorrhage. At the end of two months the patient met me with the assurrance that the surface would soon heal, but the growth increased, swelling the face enormously, and extending to the roof of the mouth. When she consulted the author, five months after seeing the first surgeon, the antrum was also involved, and the case was pronounced hopeless. Homer Coley's mixture of erysipelatous toxines were employed with no change in the growth. Later a consultation with Dr. Nicholson decided, as a last resort, to ligate both carotids, which was done by Dr. Nicholson June 19. Patient reacted, but only a temporary improvement seemed noticeable. She grew weaker daily, and died August 10, seven months after the first operation. The question as to whether the growth was malignant in its incipiency cannot be definitely decided, but it is open to question.

The case antagonizes some authorities, Kyle and others, who declared that nasal sarcoma are of slow growth. It is also opposed to the advocates of ligation as a means to shutting off the blood supply to sarcomata. The author defines his opposition to irritation of bleeding nasal growths, and emphasizes the necessity for early microscopic examination in suspicious cases. F. C. E.

An Operation for the Cure of Frontal Sinus Suppuration.—W. THETWELL THOMAS, F. R. C. S.—*Liverpool Med. Chirurg. Jour.*, Sept., 1901.

The author discusses the well known symptoms of frontal sinus suppuration and points out that the affection is never uncomplicated by similar disease in the ethmoidal cells.

In dealing with the diseased mucous membrane lining the sinus, he objects to the use of the curette as liable to expose the underlying bone to septic otitis and he insists that the chronicity of the suppuration is not due to changes in the mucous membrane, but to the confinement of septic organisms in a moist and warm situation, which organisms, if freely drained away, will allow of the mucous lining returning to its normal condition.

Having opened the sinus by the usual incision and having removed any polypi, for which "exuberant granulations must not be mistaken," a Pana probe is passed downwards via the frontal nasal canal out from the corresponding nostril. A strong loop of silk is secured in the upper end of the probe while its lower end is tightly seized by pressure forceps so that when the probe is withdrawn in an upward direction the forceps are guided to the floor of the sinus out which they are made to project. By opening the forceps anterposteriorly, the ethmoidal cells are crushed so that a free opening is made between the nose and sinus.

A strong, perforated rubber tube is next passed downwards from the sinus to the nose, is made to extrude beyond the nostril and the two free ends anchored together on the side of the nose. The external wound is then sutured in its entire length with the exception of that portion of it which is occupied by the rubber tube.

For 7 to 9 days the tube is moved upward and downward daily and syringed with some weak antiseptic solution. Then its upper end is drawn into the sinus, leaving only the silk loop externally and having cut off the lower end of the tube flush with the nostril, syringing is again carried on until the wound fistula is closed by granulations, when the silk loop is cut and the tube finally withdrawn. "The wound heals soundly in a few days," and nasal injections are continued for a few days later. The author gives very few details of some four or five successful cases, but does not mention whether by "cure" he means entire cessation of discharge from the sinus. It would have been interesting to know what other intra-nasal lesion these patients exhibited and whether the author in any of the cases removed the middle turbinal bone.

TILLEY.

The Hemorrhagic Diathesis in Relation to Operation on the Nose and Throat.—E. HARRISON GRIFFIN.—*Med. Record,* Dec. 1901.

In questioning patient, the author has failed to obtain a history of "bleeder," but such information has always been given after operative intervention.

Five cases are reported in which the unpleasant symptom of hemorrhage appears. Morphine has been found to act better to control the bleeding in a nervous case than any other drug.

It is important to question closely the patient before operation and to go into detail.

M. D. LEDERMAN.

Laryngeal Paralyses and their Importance in General Medicine.—J. W. GLEITSMANN (N. Y.).—*N. Y. Med. Jour.,* Dec. 14, 1901.

In a very interesting and scientific paper upon this difficult subject, the author has devoted much attention to the anatomical and physiological aspect of the disease under consideration. He dilates upon the experiments of Krause, Semon, Storsley, Russel and others, and points out that the planatory cortical centre in dogs, as shown by Krause, is located at the descending surface of the prefrontal convolution. Irritation of one of these areas by electricity, is always followed by symmetrical bilateral adduction of the vocal cords, phonetic movements, which also take place when one phonatory centre has been experimentally removed or destroyed by disease, and a positive indubitable case of unilateral paralysis due to cerebral lesion has not yet been reported.

Adduction of the cords (plonatory act) can also be produced by stimulating a small area in the bulbus, which, confined with the fact that acephalous monsters are able to cry, shows that phonation has a limit center in the bulbus.

The superior laryngeal nerve is the sensory nerve of the larynx and only sends motor fibres to the cricothyroid muscles, while the recurrent is the motor nerve for all the intrinsic muscles of the larynx, and supplies the adductors as well as the abductors.

The normal state of the abductor muscles during life is partial contraction, consequently the glottis is wider during quiet respiration than in the cadaveric position. When abductor paralysis exists, we should always search for a lesion of the nerve trunk.

An abbreviated abstract does not do the paper justice, and a perusal of this article in toto is recommended by the abstractor.

M. D. LEDERMAN.

The Principals of Treatment of Tubercular Laryngitis.—St. Clair Thomson (London).—*Journal of Laryngol.*, Oct. 1901.

In an interesting paper upon this subject, the author arrives at the following conclusions, based upon his own personal experience, plus the opinion of other observers:

1. Pathology and clinical experience show that in the majority of cases the focus of infection is near or in the crico-arytenoid joint.

2. Many cases only present themselves at a stage when the possibility of effecting a cure by local measures is quite untenable.

3. The principle of primum non vocere should be constantly kept before us, as many measures which have been tried in this affection have only distressed the patient and hastened the disease.

4. In the light of present knowledge and therapeutic resources, the most rational principle is to try and make an early diagnosis of the disease while in an incipient stage—any persistent or suspicious laryngeal catarrh should be treated seriously in even a presumptive diagnosis.

5. Once diagnosed, the patient should be treated on the principles laid down in the modern method of sanitorium treatment.

6. Symptomatic treatment should be directed to an irritative, catarrhal or obstructive condition of the air passages.

7. In addition, silence should be enjoined, the disuse of the voice being proportionate to the degree in which the focus of infiltration approaches interferes with the arytenoid joint.

8. In cases where the situation or extent of disease do not warrant an expectation of complete arrest of the process, treatment should be symptomatic, and in many such cases the sanitorium treatment is uncalled for.

M. D. Lederman.

An Artificial Larynx.—G. T. Hankins (Sydney, Aust.)—*Australas. Med. Gaz.*, Jan. 20, 1902.

This apparatus is for use in those cases of total extirpation of the larynx where all sinuses between the oral cavity and the external air are closed, and all direct communication between the lungs and upper air-passages cut off. It consists, essentially, of a small three-necked Wolff's bottle. Through a perforated cork in the middle neck passes a tube bearing the reed which hangs downwards in the centre of the bottle, the outer end of the tube being connected with a No. 14 (English) soft rubber catheter cut off obliquely at the end.

To one of the necks of the bottle is fitted a stiffish rubber tube four inches long and quarter-inch internal diameter, ending in a vulcanite nipple for plugging into the tracheal tube. The third neck of the bottle is left open.

The reed is one taken from a penny toy known as a "screecher." It is of the "beating" variety, and made of metal. Unlike the "free" reed of the harmonium, or mouth organ, it is of very strong tone, and cannot be over-blown. The long narrow tube of the catheter to which it is attached merely lowers the pitch without stopping the vibrations, as would be the case with the harmonium reed. The tongue of the "screecher" reed requires a little manipulation before a satisfactory effect can be obtained, but when obtained the result is permanent.

In using this apparatus the patient smears the catheter with vaseline, and passes it along the nose for six inches, where it is fixed in position by a vulcanite olive through which the catheter passes, and which is plugged into the orifice of the nostril.

The patient next inserts the nipple at the end of the short tube into the trachea opening on to the skin of the neck. He can then breathe easily and without noise so long as the third neck of the bottle is open.

When he wishes to speak this opening is closed by the forefinger of the hand holding the bottle, and on expiration the air is forced through the reed and enters the pharynx in a state of vibration just below the uvula, producing a bass note in fair imitation of the male voice.

The patient for whom the apparatus was made, can now articulate not very clearly in this case on account of one-sided paralysis of the tongue, but he can recite the only piece he knows, i. e., the Lord's Prayer, and make himself well understood.

By placing the reed in a bottle it is kept perfectly free from contact with secretions and condensed moisture, and the whole apparatus can be easily taken to pieces and kept clean.

In the instrument shown in the illustration, instead of a three-necked Wolf's bottle an ordinary wide-mouthed bottle is used, the three apertures being furnished by the use of a brass tee-piece, thus diminishing the bulk and increasing the strength of the apparatus.

EATON.

Six Cases of Excision of the Larynx.—F. G. HARVEY.—*Lancet*, September 21, 1901.

As the recorded cases of complete excision of the larynx are comparatively few, and the details of the method have not been fully described, the author thinks it may be of interest to publish these cases.

The operation may be performed by separating the trachea and cricoid cartilage from the esophagus, commencing from above and working downwards, or commencing from below and working upwards. He describes the latter method. He assumes the proper preparation of the patient for a long and serious operation, strict antiseptic precautions, and the proper warming and ventilation of the operating room, with as little exposure of the body as possible.

The first step, after administering chloroform to the patient, is to make a vertical incision extending from the hyoid bone to a point as low as the fourth or fifth ring of the trachea. A transverse cut should be made along the whole length of the under surface of the hyoid bone through skin and fascia, dividing the anterior juglar veins, which must be tied. The sterno-hyoid, the omo-hyoid, and the thyro-hyoid muscles are divided at their insertion into the hyoid closé to the bone, and the flaps thus formed are reflected downwards and outwards to either side. The thyroid isthmus should then be divided between two ligatures, and the lobes of the thyroid separated from the trachea. When the trachea is completely bared it may be divided between two ligatures, and the lobes of the thyroid separated from the trachea. When the trachea is completely bared it may be divided from before backwards, and the lower portion separated from its attachments to the esophagus and stitched to the skin. A Hahn's cannula will now be introduced, all bleeding will be arrested, and the parts immediately around the lower portion of the severed trachea will be packed with gauze. It will be found necessary to remove the Hahn's cannula from time to time, and to clear the trachea of any blood which may have found its way into it. The patient at this point must not be deeply under the influence of the chloroform, as we shall then have warning of any blood trickling into the lungs by his coughing; if this occurs it will be well to sponge out the trachea by introducing for some distance a swab or sponge on a holder. The next step will be to dissect off the upper portion of the treachea from the esophagus and the muscles from the lateral surface of the cricoid. The inferior cornu of the thyroid is next

bared by detaching and reflecting the crico-thyroid and inferior constrictor muscles. The muscles and perichondrium in front of the thyroid will now be separated and reflected as far back as the superior cornu, which latter will next be freed by dividing the periosteum on its surface, and pushing it along with the lateral wall of the pharynx and the loose areolar tissue, backwards until the posterior lateral border of the cricoid is reached. The outer two-thirds of the lateral portion of the thyro-hyoid membrane, which is attached to the superior border of the thyroid cartilage, will then be divided transversely and cautiously at the point of junction of its upper and middle thirds; and when the adjacent mucous membrane is reached this must be picked up with forceps and divided, whereby the upper portion of the epiglottis can be seized and drawn forwards. The anterior wall of the pharynx is thus opened, and by pulling the epiglottis strongly forward, and with it the whole larynx, the knife can be placed on the posterior surface of the cricoid, and by cutting downwards the anterior wall of the esophagus will be opened. Care must be taken at this point to limit the cut to the parts which are covered in front by the posterior surface of the cricoid; if this is not done the lateral wall of the pharynx and the esophagus will be unnecessarily encroached upon, and too much of their anterior walls will be removed, thus rendering it difficult to approximate their ages. The whole larynx is thus completely detached, and the defect in the pharyngeal mucous membrane must now be made good by inserting sutures quite close to the cut edges and so preventing in-turning of the epithelial surfaces. The sewing up must be water-tight, with fine catgut sutures so as to form a Y-shaped stitched line, then a row of Lembert's sutures, must be added, transfixing the muscular and cellular coats of the esophagus and pharynx. The third layer unites the stumps of the pharyngeal constrictors, and the fourth layer brings together the divided sterno-hyoid and thyrohyoid muscles. Finally, the T-shaped skin incision will be united, leaving only a three-cornered cavity above, which may be packed with iodoform gauze; thus, only the above cavity and the tracheotomy will remain unclosed. The Hahn's canula may be removed in twenty-four hours. Nutriment will be administered by the rectum for from twenty-four to forty-eight hours, after which milk may be given by the mouth. Rotter suggests that the trachea should be divided from behind forwards, but the author considers it is far more easy, expeditious, and safe to divide it as he has described. Attention is drawn to the impor-

tance of keeping blood out of the lungs, the whole success turning on this point and the accurate suturing of the pharynx and esophagus. Of the six cases noted, three were treated by this method. Of the remaining three, one was treated by the older method with a preliminary tracheotomy and stitching the pharynx to the skin; the second can hardly be classed as an excision, inasmuch as the whole of the larynx, when the soft parts covering it were reflected, was capable of being lifted off.

Details are then given of six cases. The first (epithelioma) has remained well for six years. The second survived some weeks. The third case died unexpectedly a few days after operation (no autopsy). The fourth was only a partial removal, and the patient survived five months. The fifth case died from acute pneumonia twelve months after operation. This was removed, and his health at date of publication appeared quite satisfactory.

ST. CLAIR THOMSON.

Two Cases of Radical Cure of Ozena under Influence of an Intercurrent Erysipelas of the Face.—M. MONTORO DE FRANCESCO. —*Revue Heb. de Laryng., D'Otol., et de Rhinologie*, March 8, 1902.

The first case was that of a young girl who had suffered for seven years from a severe case of ozena which had resisted all treatment. There was atrophy of the inferior turbinals and partial destruction of the bones of the nose and of the cartilaginous septum. After an attack of erysipelas which had its point of origin at the nostrils, the odor and the crusts disappeared entirely. The mucous membrane after a time recovered its normal appearance. Three years later there had been no relapse so that the cure appeared complete.

The second case was a young lad suffering from erysipelas of the leg and who was nursed by a sister who had a characteristic ozena of the left nostril. Encouraged by the result of the former case, the author had almost decided to inoculate the young girl with the erysipelas of the brother, when she spontaneously contracted the disease, which developed in the lobule of the left ear. Dr. Montoro therefore simply took care that the nostrils were involved in the infectious lymphangeitis and made some scarifications on the left cheek near the nasal ala. The erysipelatous process soon involved the whole cheek and nostril. When the patient recovered from the erysipelas, there remained no trace of the ozena.

W. SCHEPPEGRELL.

Diphtheria Treated with Antitoxin and Pilocarpin.—E. W. SAUNDERS, M. D., (St. Louis, Mo.)—*Courier of Medicine*, April, 1902.

The author declares that before the days of antitoxin his results were no better than his neighbor's. He admits his enthusiasm for his treatment—which is justifiable according to his statistics—and his conviction that by a more general employment of it diphtheria mortality can be still further reduced. He believes that the use of Pilocarpin can do no harm and will reduce the sequelae. During the past seven years there has been treated by him or his assistants upwards of 3,000 cases, not including consultations in which he could not dictate the policy from the first, without a death. There have been no special sequelae in these cases, no severe nephritis, and only a few of mild paralysis. The author's rules are, subtantially:

I. In all cases exhibiting an exudate, or psuedo-exudate administer pilocarpin to its physiologic effect, salivation, daphoresis, etc.

II. If the least suspicion of diphtheria is justifiable, the membrane should be examined microscopically, and progress noted which, if unfavorable, demand an immediate injection.

III. Dose of antitoxin should be large enough to neutralize all toxins present, and a sufficient strength to similarly act upon all that may enter the circulation in the following doses: Mild case, 1,500 units; moderate severity, 2,000 units; severe, 2,000 to 3,000 units.

IV. Special attention to quality of antitoxin is imperative. Serum deteriorates in ordinary temperature and six weeks is the maximum time, after withdrawal from the animal, that it should be used.

V. Even when temperature becomes normal, with coating membrane, pilocarpin should be continued for one or two days in diminishing doses—it stimulates leucocytes and shortens convalescence.

VI. If the case comes to notice after the fifth day pilocarpin must be used with caution on account of possible heart failure.

In conclusion, the author declares the fear that many entertain for philocarpin groundless; he has "used it in thousands of cases of children and has yet to see one instance where life seemed endangered with it."

F. C. E.

Removal of a Tooth-plate from the Œsophagus by aid of the X-rays.—NATHAN RAW, M.D. (Liverpool)—*Liverpool Medical Chirurg. Jour.*, Sept., 1901.

The patient was a well developed man, who, in an attempt to commit suicide, swallowed his plate of false teeth. By means of a bougie the foreign body could be felt some 12 inches from the lips. Fluid nourishment could not be swallowed, showing that the obstruction was complete.

By means of the X-rays the plate could be seen below the level of the upper end of the sternum and hence removal by means of any external operation would be most difficult as well as dangerous.

With the aid of a powerful X-ray tube and a current of 40 volts and 12 aupires, with the screen in front of the patient, it was possible to guide the forceps to the plate, seize one of its projections, and forcibly remove it from the oesphagus. Considerable bleeding immediately followed and later on some inflammation on both sides of the neck with expectoration of a purulent discharge. The latter symptoms soon subsided.

The author argues that the position of the tooth plate made forcible removal the only means of extraction, although it is generally agreed that no force should be used in removing foreign bodies from the oesophagus.

TILLEY.

The Application of Physical Science to the Surgery of Diseases of the Nose and Throat.—JOHN MACINTYRE (Glasgow).—*Jour. of Laryngol.*, Dec., 1901.

Promising results have been obtained by the author by the application of the "static machine" in certain forms of lupus, tubercle, epithelioma and rodent ulcer. The statements of this well known observer are very modest in tone, but they seem to imply that from his clinical experience, he anticipates a permanent place for the electric force in the treatment of the above conditions. A number of cases are cited in which improvement followed this line of therapy. How this physical force acts we do not know, but it is supposed that the rational forces at work in the tissues to cast out disease are stimulated to greater activity.

M. D. LEDERMAN.